



# A Floristic Inventory of Vascular and Cryptogam Plant Species at Fort Richardson, Alaska

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# **A Floristic Inventory of Vascular and Cryptogam Plant Species at Fort Richardson, Alaska**

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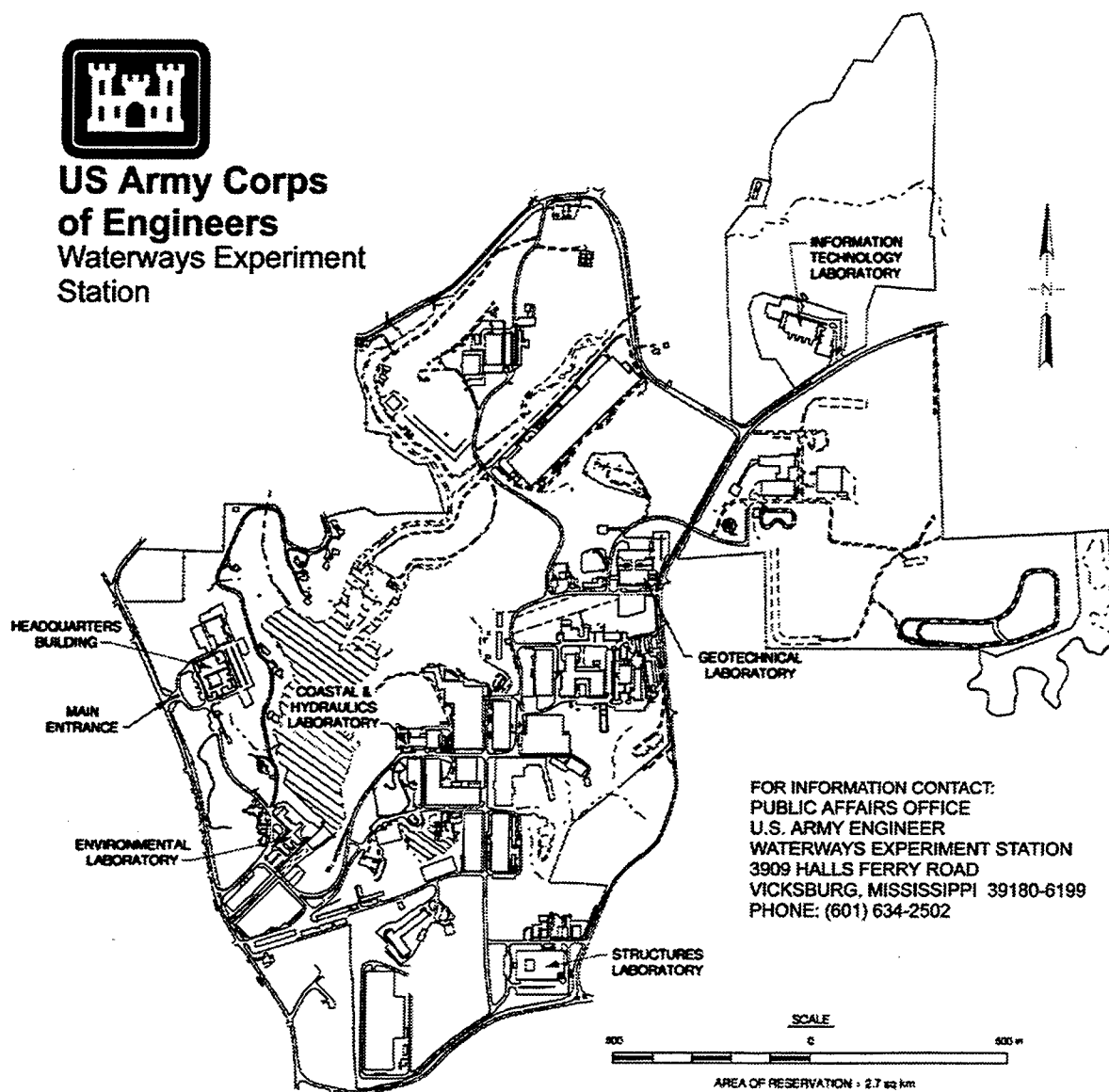
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Final report

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# Preface

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The report herein describes the methods and results for the floristic inventory of Fort Richardson, Alaska. This floristic inventory includes both vascular plants and cryptogams (mosses, lichens, and liverworts).

The work was performed by the U.S. Army Engineer Waterways Experiment Station (WES) and U.S. Army Cold Regions Research and Engineering Laboratory (CRREL). The report was prepared by Mr. Robert Lichvar, Environmental Laboratory (EL), WES, and Dr. Charles Racine, CRREL. Dr. Barbara Murray, University of Alaska, Fairbanks, authored Appendix F, the cryptogam inventory; Mr. Gerry Tande, Alaska Natural Heritage Program (AKNHP), authored Appendix A on the vegetation; and Mr. Rob Lipkin, AKNHP, authored the summary on rare vascular species. Field collectors for both vascular and cryptogam inventories include Mr. Tande, Mr. Michael Duffy, AKNHP; Mr. Lichvar, Mr. Lipkin, Mr. Scott Marler, WES; Dr. Barbara Murray, Alaska Science Museum (ALA); Dr. Roy Perry, National Museum of Wales; Dr. Racine; and Ms. Marilyn Racine, volunteer. Botanists involved with verification and processing of specimens at ALA were Mr. Al Batten, Ms. Carolyn Parker, Dr. Barbara Murray, Dr. David Murray, and Dr. Samuel Hammer of Boston University.

The work was conducted under the direct supervision of Dr. Morris Mauney, Chief, Wetlands Branch, WES, and Mr. Darryl Calkins, Chief, Geological Sciences Division, CRREL. General supervision for the study was provided by Dr. Conrad J. Kirby, Chief, Ecological Research Division, EL, WES, and Dr. John Harrison, Director, EL, WES. Cartographic work was done by Dr. Rose Kress and Ms. May Causey, EL, WES. Technical support was provided by Messrs. Dale Yocum, Robert Busch, and Ms. Kimberly Seeley, WES.

Director of WES at the time of publication of this report was Dr. Robert W. Whalin, and the Director at CRREL was Dr. Edward Link. Commander of WES was COL Bruce K. Howard, EN, and the Commander of CRREL was COL Mark Nelson.

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# 1 Introduction

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A floristic inventory was initiated at U.S. Army, Fort Richardson (FRA), Alaska, in 1994. The floristic inventory is in support of the U.S. Army Land-Condition Trend Analysis (LCTA) program, which is a major component of the Integrated Training Area Management program. The scope of the inventory included both vascular plants and ground-inhabiting cryptogams (mosses, lichens, and liverworts). The study design was developed specifically to support the LCTA field-sampling teams and program.

This inventory provides a baseline record of the existing flora for LCTA and other installation requirements. This floristic record also helps support data needs in response to the Endangered Species Act, the National Environmental Policy Act, and AR 420-74 for Natural Resources-Land, Forest, and Wildlife Management.

Objectives of this study were as follows:

- a. To compile a preliminary list of potential species that might occur at FRA from herbarium and literature sources.
- b. To subdivide FRA into floristic inventory areas to provide for representative collections from all parts of the facility.
- c. To collect triplicate sets of all voucher specimens for vascular species and a duplicate set for cryptogams from FRA. This included an effort to make a comprehensive collection of vascular plants but only common ground cover cryptogams.
- d. To identify the specimens collected in the field to the appropriate sub-specific level. Final verifications of specimens were to be completed with assistance from specialists at the Alaska Science Museum, University of Alaska, Fairbanks, (ALA).
- e. To briefly characterize the landscape and floristic setting at FRA.
- f. To provide a species list for FRA that provided occurrence data by major landscape types.

The following chapters briefly describe the setting for and the methods used to describe the flora of FRA.

## 2 Description of the Study Area

### Location and Topography

FRA covers 21,193 hectares (ha) (59,735 acres) in south-central Alaska and is located within the municipality of Anchorage (Figure 1). Anchorage is located on the tip of a broad flat peninsula protruding into Cook Inlet. Two fjord-type arms of Cook Inlet extend northeast and southeast from the tip of this peninsula. FRA is located on Knik Arm, the northeast-tending branch.

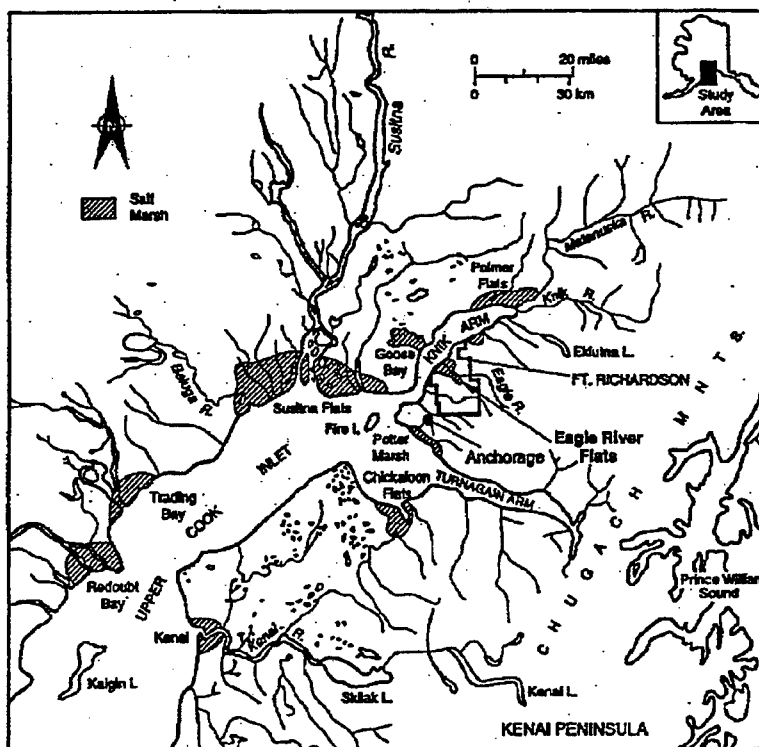


Figure 1. General locality map of Cook Inlet and Fort Richardson also showing coastal marshes



Behind the flat coastal strip of land is the western extremity of the Chugach Mountain Range, which extends eastward along the Gulf Coast of Alaska into Canada. FRA is located at the west end of this range. It therefore includes a broad diversity of topographic, geologic, and climatic environments ranging from tidal flats on Knik Arm to flat coastal lowland forests and up to the peaks of the Chugach Mountains over 1,524 m (5,000 ft) in elevation. This change occurs over a distance of less than 16 km (10 miles) (Figure 1).

Several major rivers originate in the Chugach Mountains and flow across FRA to Knik Arm. Eagle River is the largest river on the installation and the only one fed by glacial runoff. Although it originates off the base, it flows through the middle of FRA and forms a canyon, floodplain, and large estuarine salt marsh at its mouth (Eagle River Flats) on FRA. Ship Creek, a clear water creek, also flows west out of the Chugach Mountains across part of FRA and empties into Cook Inlet in Anchorage. Ship Creek, parts of Snowhawk Creek, and the North Fork of Campbell Creek form large deep valleys in the Chugach Mountain portions of FRA. Above these valleys are important mountain peaks, including Site Summit at 1,190 m (3,900 ft), Tanaina Peak, and Temptation Peak at 1,615 m (5,300 ft). Treeline occurs at an elevation of about 750 m (2,500 ft) on the Chugach slopes.

Lakes, bogs, and smaller kettles are abundant in the forested coastal lowlands, with the larger lakes including Otter and Clunie. Snowhawk Lake is a glacial tarn in the mountains at the head of Snowhawk Creek (Figure 2).



Figure 2. Head of Snowhawk Creek drainage

Although much development has removed wetlands, forests, and other natural habitats in and around Anchorage, most of FRA is well preserved. The cantonment area covers about 5 percent of the base, and numerous roads and trails provide access to much of the base.

## Geology

The landscape of FRA is strongly controlled by the mountains and, in the lowlands, by past glacial events described by Miller and Dobrovolsky (1959) for the Anchorage area. The description below is taken from Rothe et al. (1983), who summarized the glacial geology for Elmendorf Air Force Base, which does not include the mountains.

The bedrock of the Anchorage area consists of moderately consolidated rocks of conglomerate, sandstone, mudstone, and coal that covered the Cook Inlet-Susitna Lowlands during the Tertiary Period (U.S. Army Corps of Engineers (USACE) 1979). The bedrock of the Chugach Mountain Range is a relatively uniform acidic greywacke. Unconsolidated material (a mixture of unstratified gravel, sand, silt, and clay) was deposited during the latter part of the Ice Age or Pleistocene Epoch one million to 10,000 years ago. These deposits include a thin veneer of windlaid silt covering much of the lowlands, alluvium along present streams, clay and silt deposited in recent lakes and the present tidal zones, and organic material or peat in wetlands. The Matanuska-Knik lobe of the Naptowne glacier of the Wisconsin Epoch moved from the northeast toward the Anchorage area, and south to approximately the position marked by the Elmendorf Moraine. Stagnant blocks of ice were left as it retreated. A lake was created when the glacier blocked the drainage of the Eagle River valley. When this lake overflowed, it cut channels along the south side of the Eagle River valley and water flowed toward Knik Arm along the south side of the Elmendorf Moraine. As the lake drained, the flat outwash plain was deposited parallel to the south side of the end moraine. Eagle River periodically changed its course, at some time flowing along each of the several abandoned channels. Depressions (kettles) that have resulted in lake, pond, and wetland basins were formed where buried ice melted.

The Elmendorf Moraine extends onto FRA with a steep south slope and a gentle north slope. Much of its surface is covered by kettles and kames. North of the Elmendorf terminal moraine there is ground moraine that extends to Knik Arm and forms high steep bluffs. Away from the Arm the surface is pitted with kettles and many drumlins that are oriented toward the southwest.

## Soils

The soils of FRA have been partially mapped by the U.S. Department of Agriculture, Natural Resources Conservation Service as part of a Metropolitan Anchorage Urban Study (USACE 1979). Twenty-one soil series are described and mapped. The map area only includes the footslopes of the Chugach Mountains up to about 457 m (1,500 ft). Most of the well-drained soils are formed in gravelly glacial till with a thin mantle of silty loess at the surface. Some overlie thick deposits of very gravelly sand, and a few are formed in deep sandy materials. Poorly drained soils occur in shallow depressions, swales, drainageways, and on slopes affected by seepage. They are commonly formed in or are underlain by firm or compact glacial till. Areas of very poorly drained peat occupy broad depressions and other low-lying areas.

## Climate

Anchorage is located in a climate transitional from maritime to interior-continental with generally moderate annual temperatures (daily mean = 1.9 °C; average daily maximum = 6 °C; average daily minimum = -2.2 °C). Precipitation averages 400 mm (15.8 in.) annually, about half of which falls as snow. Approximately two-thirds of the total precipitation occurs during the second half of the calendar year.

The freezing season usually begins at the end of October and lasts about 157 days or 5 months. The thawing season lasts about 200 days with spring beginning about April 1 and ending in late October. Precipitation is light during the spring.

The Chugach range acts as a barrier to the influx of warm, moist air from the Gulf of Alaska, so the average annual precipitation in Anchorage is only 10 to 15 percent of that at stations on the Gulf of Alaska side of the Chugach Range. At the same time the Alaska Mountain Range, 161 km (100 miles) north of Anchorage, acts as a barrier to the influx of very cold air from the interior. Therefore, summers are cooler and winters warmer than at more inland stations.

Numerous sporadic pockets of permafrost have been found in wetlands in the Anchorage area. To date, no permafrost has been located on FRA, but it may be present in wetland peat areas or at higher elevations in the Chugach Mountains. Snowbeds are common at higher elevations in the mountains and in some years may persist throughout the summer months.

Tides on Cook Inlet are among the highest on earth, with an amplitude of over 12 m (39 ft). The Eagle River Flats tidal marsh on FRA floods during tides that exceed 9 m (31 ft) based on the Anchorage tidal charts. This occurs about once per month.

## Floristic Zones and Vegetation Types

Because of the above-described topographic and geologic diversity of FRA, the reservation was divided into five floristic zones (Plate 1). These zones were different to describe species occurrences within FRA. The five zones were classified further into 39 vegetation types by Tande (Appendix A). Each of these floristic zones is described below and is shown on the Landsat image on Plate 1.

### Coastal halophytic zone

The coastal halophytic zone influenced by salt water along Cook Inlet (Knik Arm), principally comprising Eagle River Flats, is an 865-ha (2,136-acre) salt marsh on Knik Arm (Figure 3).



Figure 3. Eagle River Flats facing inland to the east

### Lowland interior forest zone

The lowland interior forest zone of expansive boreal forest habitats below is approximately 460 m (1,500 ft) elevation. This zone covers the largest area on FRA and includes bogs, alders, shrublands, and a broad range of mesic to dry forest types (including white spruce, white spruce-paper birch, paper birch, white spruce-cottonwood, black cottonwood, balsam poplar, and quaking aspen) (Figure 4).



Figure 4. Lowland boreal forest and Eagle River Flats/Knik Arm in foreground with Chugach Mountains in the background

### **Subalpine zone**

The subalpine zone of intermittent forested areas, shrub, and meadow habitats is from approximately 460 m (1,500 ft) elevation to treeline at about 760 m (2,500 ft). This is a fairly restricted zone. Mesic to dry sites include white spruce, white spruce-paper birch, balsam poplar, and mountain hemlock (Figure 5). Forests are interspersed with alder shrub and grass forb meadows. Treeless bogs are occasionally present in the subalpine zone.

### **Alpine zone**

The alpine zone consists of mountain landscape habitats above treeline at about 760 m (2,500 ft). Low shrubs and dwarf shrubs occupy wet and mesic to dry habitats. The latter include mesic to dry vegetated sites and dry nonvegetated sites such as rock talus and blockfields (Figure 2). Wetter habitats include late-melting snowfields and snowbeds.

### **Artificially cleared or disturbed zone**

The artificially cleared or disturbed zone of the cantonment area, powerlines, roadsides, railroad rights-of-way, borrow pits, and other human-modified areas are shown in Figure 6.

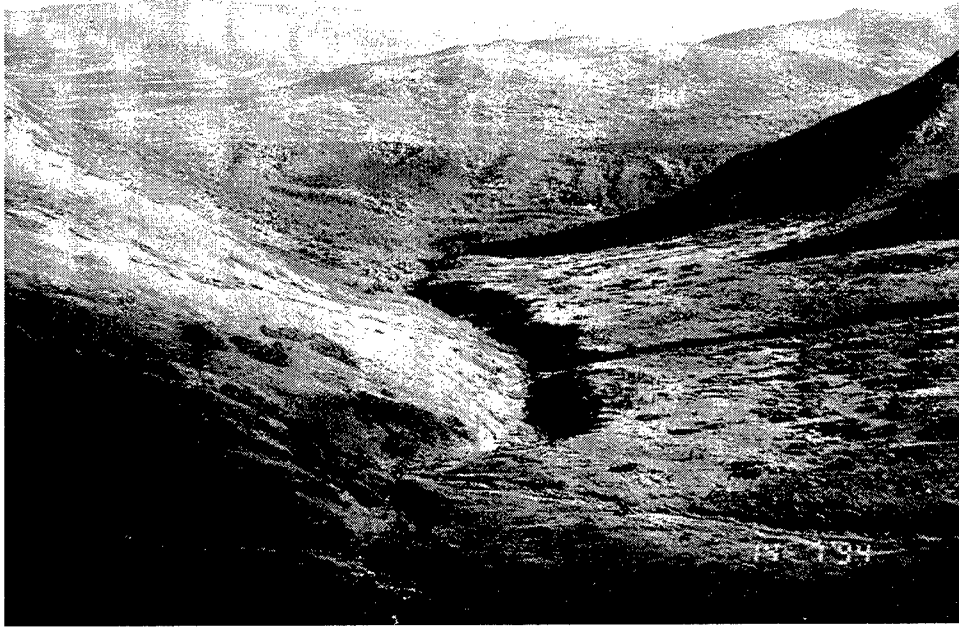


Figure 5. Snowhawk Creek drainage

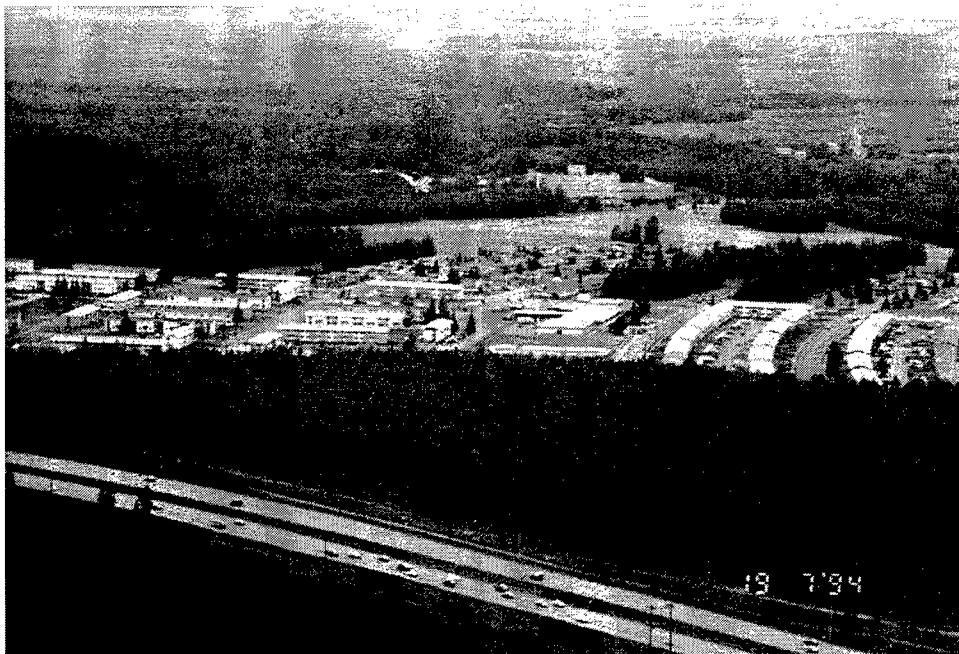


Figure 6. Cantonment area and Glen Highway

## 3 Methods

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### Sampling Protocol

The inventory of the flora of FRA was designed to meet the needs of the LCTA program. The inventory included vascular plant species throughout FRA at a more comprehensive level, while cryptogams were inventoried at a more general level. The cryptogam survey focused more on common ground cover species, but many other taxa from different habitats were collected.

#### Preliminary inventory of vascular plants

The inventory included compiling known species occurrences from the literature and field collections to produce a potential species list. Initially, a herbarium search was planned to develop a known list of species from within the area. Because a limited number of collecting records for the area were available at the ALA herbarium, no effort was made to compile existing specimen data for FRA. Instead, a potential species occurrence list was developed for FRA. The potential list comprised 739 taxa and was developed from the following sources: *Flora of Alaska and Neighboring Territories* (Hultén 1968), *A Floristic Survey of the Eklutna Valley, Chugach State Park* (Marvin 1986), *Natural Resource Inventory of Elmendorf Air Force Base* (Tande 1983), and the database from ALA. Most of the collections were made by the Alaska Natural Heritage Program (AKNHP) team with some help from Mr. Lichvar and Dr. Racine, two of the authors of this report.

#### Preliminary inventory of cryptogams

Available taxonomic and distributional data were gathered from numerous sources, primarily the personal library of books, journals, and reprints of Dr. Barbara Murray, ALA. Those useful for field and preliminary identification were taken into the field along with microscopes and reagents to aid in preliminary sorting. Collections were made by Drs. Murray and Roy Perry. Most of the identifications of cryptogams were made by Dr. Murray.

## Orientation in the field

The goal for field collections was based on several factors: a representative collection for the installation, phenology, and collection of representative habitat or landscape types. To provide for a representative survey of the installation, a collecting area map was developed for FRA. This collecting map was developed based on a combination of access, watershed, and elevation data (Plate 2). The six collecting areas were divided along east-west trending borders along a north-south axis. The nine LCTA cover types developed from a classification of satellite images were considered when the floristic collecting area map was developed.

To ensure adequate collecting within each area, other specialized habitats were identified and sampled (Tables 1 and 2). In all, 98 collecting sites were surveyed within the six collecting areas for both vascular and cryptogam plants. Many of these collecting sites were visited and resampled several times during the growing season to collect specimens in proper anthesis or fruit. The six collecting areas were as follows:

- Area I. North of Clunie Lake and Clunie Creek  
(bogs, lake margins, spruce-hardwood forest)
- Area II. Eagle River Area  
(coastal marsh, floodplain, spruce-hardwood forest)
- Area III. Cantonment Area (disturbed)  
(roadsides, etc.)
- Area IV. Site Summit (Nike Site)  
(several forest types, subalpine meadows, shrub alder, alpine)
- Area V. Ship Creek  
(spruce-hardwood forest, floodplain)
- Area VI. Snowhawk Creek, Long Lake  
(high alpine scree, rock glaciers)

Plant inventory work was performed throughout the 1994 field season. Collections of vascular plants began in late May and continued until mid September. The lowlands and mountain slopes were surveyed during the early to mid part of the season. The high montane and alpine areas were mostly collected in August. Areas that were productive in providing previously uncollected species were revisited several times. Cryptogam collections were made from late June until mid July (sites are shown on Plate 2). Access to all the areas except Snowhawk Creek was achieved by vehicle or on foot. The Snowhawk Creek drainage was surveyed with helicopter support from the Alaska National Guard. Several 1-day collecting trips were made by teams of vascular and cryptogam specialists transported by helicopter to various areas in these drainages.



**Table 1**  
**Vascular Plant Collection Sites**

Locality	Locality Number	Latitude	Longitude
Eagle River Flats General	9802	61°19'00"N	149°43'00"W
Otter Lake-Northeast Corner	9804	61°17'30"N	149°43'10"W
Fort Richardson, Site Summit	9805	61°22'30"N	149°34'30"W
Eagle River Bridge Bluffs	9806	61°18'45"N	149°41'0"W
Malamute Drop Zone	9807	61°21'40"N	149°39'00"W
Arctic Valley Roadside	9809	61°14'06"N	149°34'25"W
Arctic Valley Alpine-East	9810	61°14'40"N	149°34'00"W
Otter Lake West Corner	9811	61°17'26"N	149°44'40"W
Otter Lake West Corner	9812	61°17'26"N	149°44'40"W
Gwen Lake	9813	61°17'55"N	149°40'45"W
Artillery Road Bog	9814	61°19'30"N	143°82'20"W
Route Bravo, 1 mile North of Eagle River Bridge	9815	61°19'28"N	149°40'29"W
Route Bravo, South of Eagle River Bridge	9816	61°18'30"N	149°40'45"W
Nike Site High Alpine-West	9817	61°15'38"N	149°31'24"W
Ship Creek Riparian Forest	9818	61°14'27"N	149°42'15"W
Arctic Valley Alpine-West	9819	61°14'30"N	149°34'58"W
Arctic Valley Subalpine Meadow	9820	61°14'37"N	149°35'00"W
Arctic Valley Subalpine Bog	9821	61°14'50"N	149°35'15"W
Nike Site High Alpine-West	9822	61°15'42"N	149°32'15"W
The Dome Subalpine	9823	61°10'30"N	149°39'00"W
The Dome Alpine	9824	61°10'38"N	149°38'37"W
Northwest Boundary Trail	9825	61°17'59"N	149°46'11"W
Northwest Boundary Forest	9826	61°19'15"N	149°46'15"W
Northwest Boundary Muskeg	9827	61°19'15"N	149°46'00"W
Northwest Shoreline Beach	9828	61°19'45"N	149°46'00"W
Northwest Eagle River Flats	9829	61°19'32"N	149°45'40"W
Poleline Forest	9830	61°18'14"N	149°38'02"W
Northwest Eagle River Flats Access Roadcut	9831	61°18'59"N	149°45'06"W
(Continued)			

**Table 1 (Concluded)**

Locality	Locality Number	Latitude	Longitude
Otter Lake Boathouse Shoreline	9832	61°17'32"N	149°44'10"W
Ship Creek Dam Roadside	9833	61°13'35"N	149°38'00"W
Ship Creek Dam Canyon Area	9834	61°13'35"N	149°37'55"W
Spur Road North of David Highway-Railroad Bed	9835	61°15'48"N	149°44'09"W
Upper Snowhawk-East Ridgetops	9837	61°09'44"N	149°33'11"W
Upper Snowhawk Cabin Meadow	9838	61°10'15"N	149°34'10"W
Upper Snowhawk Lake	9839	61°08'42"N	149°32'00"W
Upper Snowhawk Canyon	9840	61°09'30"N	149°33'00"W
Walden Lake Aquatics	9841	61°20'15"N	149°39'12"W
Waldon Lake Bog	9842	61°20'55"N	149°37'55"W
Building 700 Parking Lot/D St. Roadside	9843	61°15'45"N	149°42'40"W
Eagle River Bluffs-North	9844	61°18'35"N	149°49'30"W
Eagle River Bridge-South	9845	61°18'43"N	149°41'28"W
Eagle River Flats-Southwest Meadows	9846	61°18'05"N	149°42'25"W
Eagle River Flats-Dead Birch Island	9847	61°18'02"N	149°42'05"W
Eagle River Flats-Spruce Island	9848	61°17'57"N	149°42'12"W
Eagle River Flats-Otter Creek	9849	61°18'05"N	149°42'25"W
Lower Snowhawk-Ridgetops	9850	61°11'45"N	149°33'15"W
Lower Snowhawk-Upper Subalpine	9851	61°12'04"N	149°33'45"W
Lower Snowhawk-Upper Subalpine	9852	61°12'00"N	149°35'00"W
Lower Snowhawk-North Rock Outcrops	9853	61°12'15"N	149°34'30"W
Lower Snowhawk-Lower Subalpine	9854	61°12'02"N	149°33'31"W
Lower Snowhawk-Lower Subalpine	9855	61°11'57"N	149°34'26"W
North Campbell Creek Canyon-Pass	9856	61°07'10"N	149°29'45"W
North Campbell Creek Canyon-Rock Glaciers	9857	61°06'39"N	149°30'49"W
North Campbell Creek Canyon-Snowbelt Stream	9858	61°07'14"N	149°31'00"W
Eagle River Bridge-North	9859	61°18'46"N	149°41'22"W
Muldoon Bog	9860	61°12'13"N	143°42'62"W
Otter Creek @ Loop Roadside	9861	61°17'73"N	149°43'56"W

**Table 2**  
**Cryptogram Plant Collection Sites**

No. on Map	Locality Number	Locality	Latitude/Longitude
1	10190	Beach Lake 0.15-1 km W	61°40'00"N 149°34'00"W
2	10183	Engineer Expressway, Firing Point 7	61°15'55"N 149°39'00"W
3	10192	Lake Clunie, N end	61°00'00"N 149°36'00"W
4	10191	Artillery Road, 0.7 km SE of jct. with Route Bravo	61°19'30"N 149°38'00"W
5	10193	Otter Lake, S and SW end of 6117	61°17'26"N 149°45'00"W
6	10181	Loop Road, 2.5 km W of Otter Lake	61°26'00"N 149°42'00"W
7	10188	Site Summit, 1 km W of Arctic Valley Ski Area	61°15'36"N 149°33'00"W
8	10179	Site Summit, 1.5 km N of Arctic Valley Ski Area	61°15'21"N 149°31'00"W
9	10187	Site Summit Road, 2.5 km W of Arctic Valley Ski Area	61°25'00"N 149°31'00"W
10	10186	Cottonwood Park, Arctic Valley Road by Ship Creek	61°23'00"N 149°41'00"W
11	10199	Ski Bowl Road	61°23'00"N 149°37'00"W
12	10198	Site Summit Road, just N of junction with Ski Bowl Road	61°23'00"N 149°33'00"W
13	10182	Ski Bowl Road	61°23'00"N 149°33'00"W
14	10189	Site Summit Road, just N of junction with Ski Bowl Road	61°25'00"N 149°33'00"W
15	10194	Ship Creek, off Ski Bowl Road	61°21'00"N 149°38'00"W
16	10195	Ship Creek, S side, Gaging Station off Ski Bowl Road	61°22'00"N 149°37'00"W
17	10196	Ship Creek, S, off Ski Bowl Road	61°21'00"N 149°37'00"W
18	10185	Bulldog Trail	61°20'00"N 149°41'00"W
19	10184	North Fork Campbell Creek, near junction with Bulldog Trail	61°20'00"N 149°42'00"W
20	10197	Snowhawk Lake and ground on W-facing slopes	61°15'00"N 149°32'00"W

All floristic zones were sampled numerous times except for Area I, north of Clunie Creek and Lake. Collecting in Area I was less intense because of continual training maneuvers.

## **Specimens and Labels**

Specimens were collected in triplicate for vascular plants when possible and in duplicates for the cryptogams. Specimens for vascular plants were placed in standard plant presses and dried under moderate heat with electric plant driers for a minimum of 2 days. Cryptogams were air-dried and stored in field packets.

Field data were entered into a computerized database throughout the collecting season. Using a customized *Fourth Dimension Database* in MACINTOSH developed by ALA, field notes were recorded for all collections. This database system had the capability of recording all site data, locations, and taxa names. Later, during the specimen verification process, any necessary changes were made in the database. Plant labels were developed directly from the database.

Collections from the study were prepared as various types of specimens. For vascular species, two sets were developed into herbarium specimens and one set into laminated mounts. Laminated specimens were intended to be used in the field for reference material during the LCTA sampling. One set of specimens will be retained at ALA as a voucher set for the study, and the two sets, laminated and herbarium mounted, will be stored at FRA for support of the additional LCTA program. Cryptogam specimens supplied to FRA were provided in small bags and petri dishes for field use. One set was retained at ALA as a voucher set, and the other will be stored at FRA.

## **Identification and Verification of Specimens**

Vascular plant specimens collected by field botanists were identified in several steps. Many of the specimens were collected and tentatively identified during the collecting season using local keys and other references. Later, all specimens were either verified or identified at ALA with known specimens to ensure proper identification.

## 4 Results and Discussion

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### Vascular Plants

#### Floristic affinities

The flora of FRA reflects the transitional nature of the climate and geography between Pacific maritime southeastern Alaska and continental interior Alaska. Species typical of the Pacific maritime area such as western hemlock (*Tsuga heterophylla* (Raf.) Sarg.) and sitka spruce (*Picea sitchensis* (Bong.) Carr.) occur south along Turnagain Arm but do not reach FRA. However, some understory species of the Pacific maritime forest such as devil's club (*Oplopanax horridus* Miq.) do occur on FRA. In addition, Mountain Hemlock (*Tsuga mertensiana* (Bong.) Carr.), a Pacific coast species, occurs in subalpine forests on FRA. The majority of forests located on FRA are a spruce-hardwood boreal forest similar to those found in interior Alaska.

The halophytic salt marsh flora of Eagle River Flats on FRA is more similar to the lower latitude Pacific coast flora than to the Bering Sea coast-Arctic salt marsh flora with species such as *Carex lyngbyei* Hornem. typical of the Pacific Coast.

#### Summary of vascular plant checklist

One thousand eighty-seven collections were made during the field season, representing 561 species, or 588 taxa (including subspecies and varieties), 75 families, and 246 genera (Appendix B). The 561 species were 187 fewer than the potential species list. The difference probably resulted from the interpretation that all species with a range depicted in Hultén for the Anchorage area would possibly occur at FRA. The collection shows a high floristic diversity for such a northern location. Including infraspecific taxa, FRA has approximately 30 percent of Alaska's vascular flora. This floristic diversity reflects the great variety of habitats from estuarine to alpine, as well as FRA's biogeographic position at the juncture of several floristic regions.

## Species occurrence by vegetation zones

Species occurrences from FRA were developed into a generalized vegetation and habitat matrix (Appendixes C and D). Each species was assigned to each habitat location as it was either observed or collected. The major zones that the species were assigned to were lowland, subalpine, and alpine. Each of these zones was further divided into a wet and mesic to dry habitat. The vascular species at FRA were distributed as follows within these three zones: (a) 318 in lowlands with 166 occurring in wet areas and 152 in mesic to dry habitats, (b) 226 in the subalpine with 72 in wet areas and 154 in mesic to dry habitats, and (c) 206 in the alpine with 30 in the wet areas and 176 in the mesic to dry habitats (Figure 7).

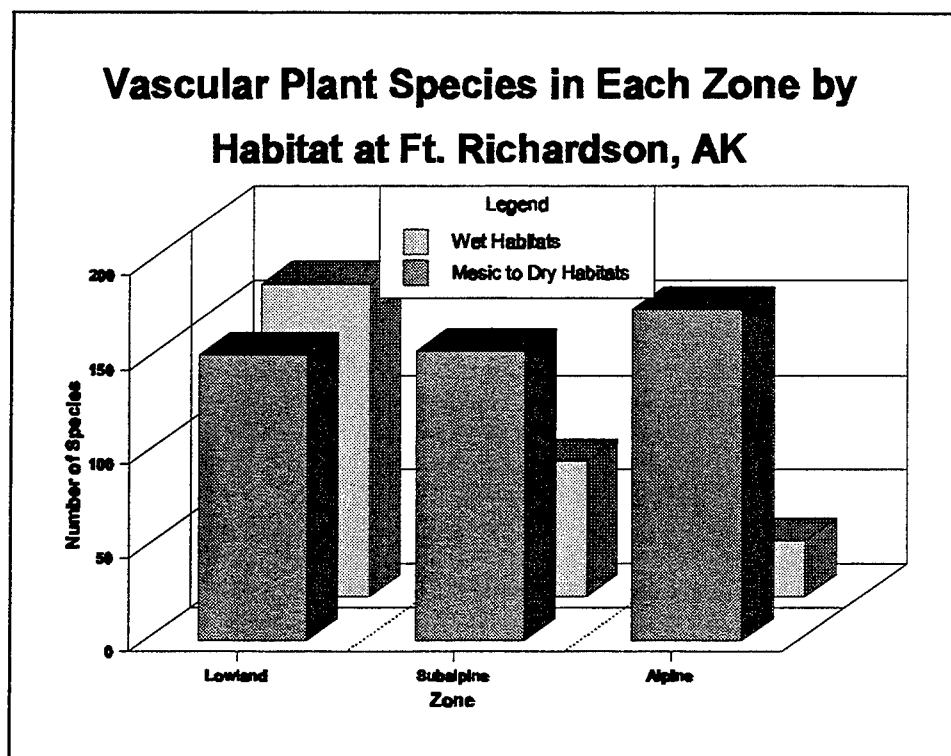


Figure 7. Number of vascular plant species in each zone by habitat at Fort Richardson, Alaska

## Range extensions

The floristic survey found many range extensions for species and new locations for rare taxa. At least 75 of the taxa collected represent minor or major extensions of their range as mapped in Hultén (1968). A number of these species are introduced or have escaped from cultivation, and others are minor, peripheral extensions or range connections. Approximately 40 of these taxa may be considered significant range extensions.

The floristic survey located several populations of rare plants being tracked by AKNHP Biological and Conservation Database (Appendix E). Many of these rare taxa were found in alpine habitats or in aquatic and wetland sites.

### Rare vascular plants

Of the rare taxa, only one species has status as a U.S. Fish and Wildlife Service Category 2 Candidate Species for threatened or endangered status. This species, *Taraxacum carneocoloratum* A. Nels., is an alpine endemic of Alaska and the Yukon Territory and has recently been found at an increasing number of sites; its status as a Category 2 candidate may need to be reevaluated. It is now known from several locations in the Chugach Mountains where it favors high alpine screes and tundra.

A number of the other taxa are also considered to be rare over their entire range. Many of these are endemic to Alaska or to Alaska and adjacent parts of Canada and the Russian Far East. These taxa are all found in alpine or rocky, gravelly, disturbed areas. Although some of them are being found at more locations as the flora of Alaska becomes better known, they are all known from fewer than 50 locations. They include *Aphragmus eschscholtzianus* Andr., *Douglasia alaskana* (Cov. and Stand. ex Hult.) S. Kelso, *Draba borealis* DC. var. *maxima* (Hult.) Welsh, *Draba kamtschatica* (Ledeb.) N. Busch, *Draba ruaxes* Payson and St. John, *Draba stenopetala* Trautv., *Papaver alboroseum* Hult., *Taraxacum carneocoloratum* Nels., and *Thlaspi arcticum* Pors.

A second group of rare taxa are common in other parts of their range but are rare within Alaska. Often these are widely disjunct from the main portions of their ranges. Some of these, especially those from aquatic sites, are easily overlooked and are likely to prove more common as additional areas are surveyed. They include *Anemone multifida* Poir. var. *saxicola* B. Boivin, *Carex deweyana* Schwein., *Eleocharis kamtschatica* (C.A. Meyer) Kam., *Eriophorum viridi-carinatum* (Englem.) Fern., *Glyceria striata* (Lam.) Hitchc. ssp. *stricta* (Scribn.) Hult., *Hammarbya paludosa* (L.) Ktze., *Malaxis monophylla* (L.) Sw. var. *brachypoda* (A. Gray) Morris and Ames, *Myriophyllum verticillatum* L., *Najas flexilis* (Willd.) Rost. and Schmidt, *Phalaris arundinacea* L., *Salicornia europaea* L., *Saxifraga adscendens* L. ssp. *oregonensis* (Raf.) Bacigalupi, *Smilacina stellata* (L.) Desf., *Stellaria umbellata* Turcz., *Viola selkirkii* Pursh, and *Zannichella palustris* Pursh.

# Cryptogams

## Cryptogam distribution patterns

Distribution and frequency of bryophytes and lichens are heavily influenced by moisture and substrate pH. FRA is relatively uniform with somewhat dry and acidic substrates, so many of the most common bryophytes and lichens tended to be widely distributed from lowland to the alpine and in several communities in each zone. Hyperoceanic taxa were not seen, and very few taxa that indicate calcareous substrates were collected.

## Summary of cryptogam plant checklist

A total of 986 collections were made (including 69 observations not documented by specimens). These collections represent 239 identified species, or 256 taxa (including subspecies and varieties). These represented 19 hepatics, 112 lichens, and 108 mosses (Figure 8) (Appendix F).

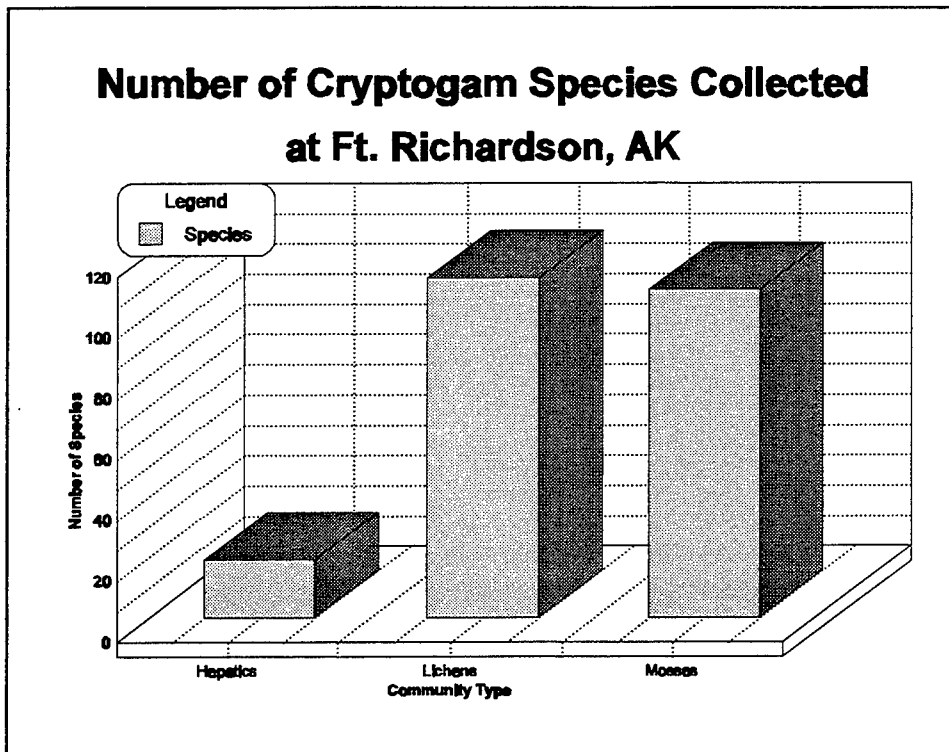


Figure 8. Number of cryptogam species collected at Fort Richardson, Alaska



## Cryptogam occurrences by vegetation zones

Using the generalized vegetation zones, cryptogam occurrences for identified species at FRA were as follows: (a) 279 species in the lowlands, (b) 126 species in the subalpine, and (c) 171 species in the alpine areas (Figure 9). Two hundred and eighty-one terricolous (on ground) species were collected (excluding those on rotting wood or soil over rock). Collection of the 281 terricolous species included 13 hepatics, 137 lichens, and 131 mosses (Figure 10) (Appendix G).

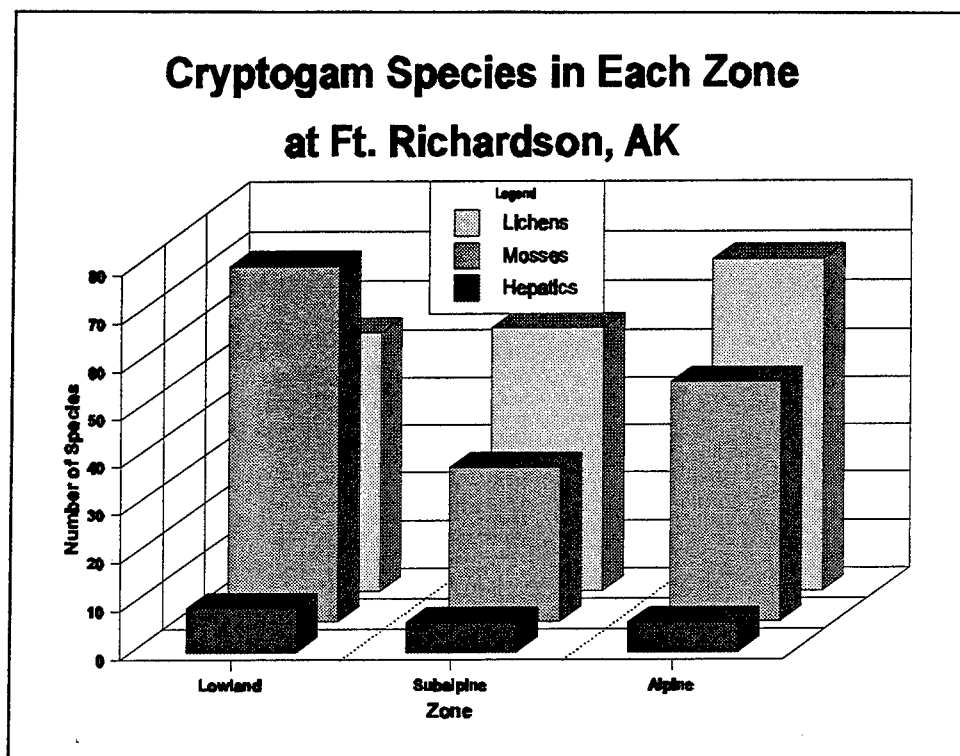


Figure 9. Number of cryptogam species in each zone at Fort Richardson, Alaska

In the lowlands, 282 collections were from forested areas. These included open birch, closed birch, closed birch-white spruce, open balsam poplar, closed white-spruce, closed white spruce-birch, and black spruce-birch. Other collections were from riparian alder scrub, disturbed sites such as roadsides and banks, a sphagnum bog, and a marsh at the edge of a lake. Of these 282 collections, 22 represent hepatics, 60 lichens (mainly *Peltigera* and *Cladonia*), and 200 mosses (including 50 sphagna from bogs and marshy edges of lakes only, and 15 Polytrichaceae).

Bryophytes dominated the wet habitats, and lichens dominated the mesic sites in the subalpine zone. One hundred and thirty of the collections, representing 81 ground cover species, were from the subalpine zone,

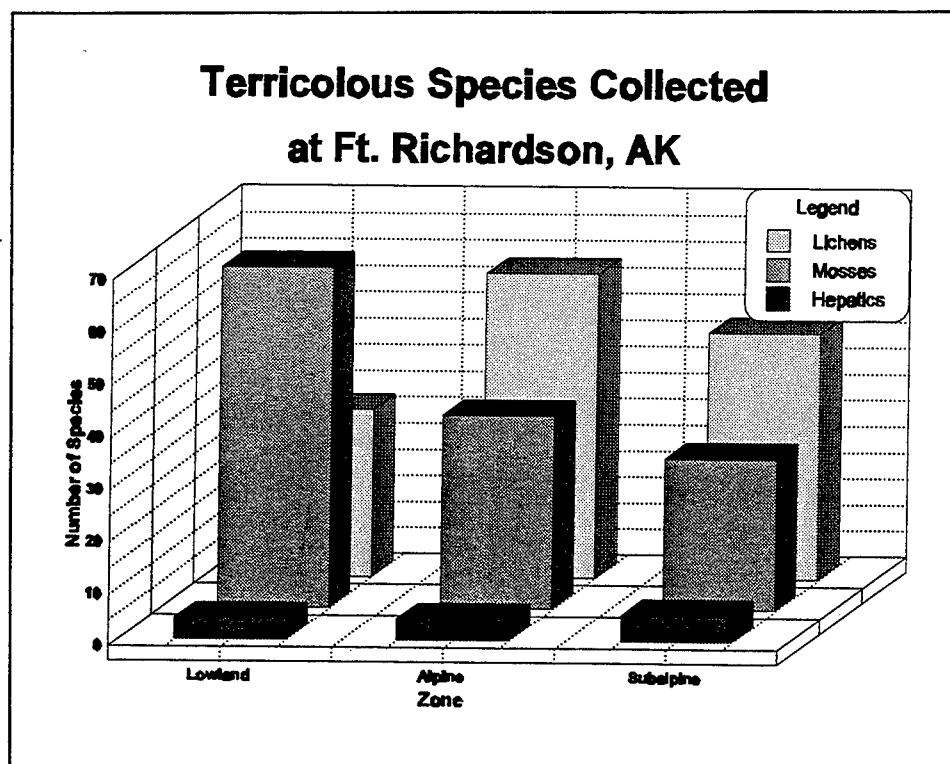


Figure 10. Number of terricolous species collected at Fort Richardson, Alaska

including 20 hepatic taxa, 70 lichen taxa (including about 20 species *Cladonia*), and 40 moss taxa. In the alpine zone, lichen taxa included 26 *Cladonia* taxa, 13 *Cetraria*, and 13 *Stereocaulon*, while mosses in the alpine zone included 14 Polytrichaceae and 12 *Racomitrium* species.

Records for identified cryptogam species from substrates other than ground (trees, logs, rocks, etc.) included 74 species of which 36 are from lowland forest, 12 from the subalpine zone, and 26 from the alpine.

### Rare cryptogam plants

One taxon was located at FRA that has not been reported outside of southeast Alaska. This taxon is *Schistostega pennata* (Luminous moss). It occurs in deep shade and has a persistent protonema with convex cells that refract light and give off a yellow-green glow.

## Recommendations for Further Studies

Based on the level of effort and the results of this study, several recommendations can be made for any further floristic surveys. These include the following:

- a. Conduct surveys for phenologically early species. During this survey, relatively few taxa were collected prior to mid-June.
- b. Conduct more detail collecting in floristic collecting Zone 1. Specifically, collect wetlands, drainageways, and coastal areas. This zone was undercollected due to continuous training maneuvers during this survey period.
- c. Conduct further surveys in specific habitats for those "potential species" not located during this survey but known to occur elsewhere in the Anchorage area.
- d. Additional surveys could be conducted in the following areas: vicinity and north of the National Cemetery, Fossil Creek drainage, alpine and subalpine areas north of the Nike Site summit, subalpine/treeline *Populus* and grass-forb communities on the southwest slopes of Campbell Creek canyon, Ship Creek valley, and Chester Creek, Ship Creek riparian areas west of the hatchery, wetlands north of the golf course, alpine dome west of Snowhawk Creek valley, and high alpine areas west and northwest of Temptation Peak.
- e. Make additional collections of *Salix* and *Betula* across FRA.
- f. Develop the distinguishing characteristics for the more common cryptogam species for field identifications. This effort might include an interactive, illustrated set of keys supported by useful handbooks and lists of published color photographs.

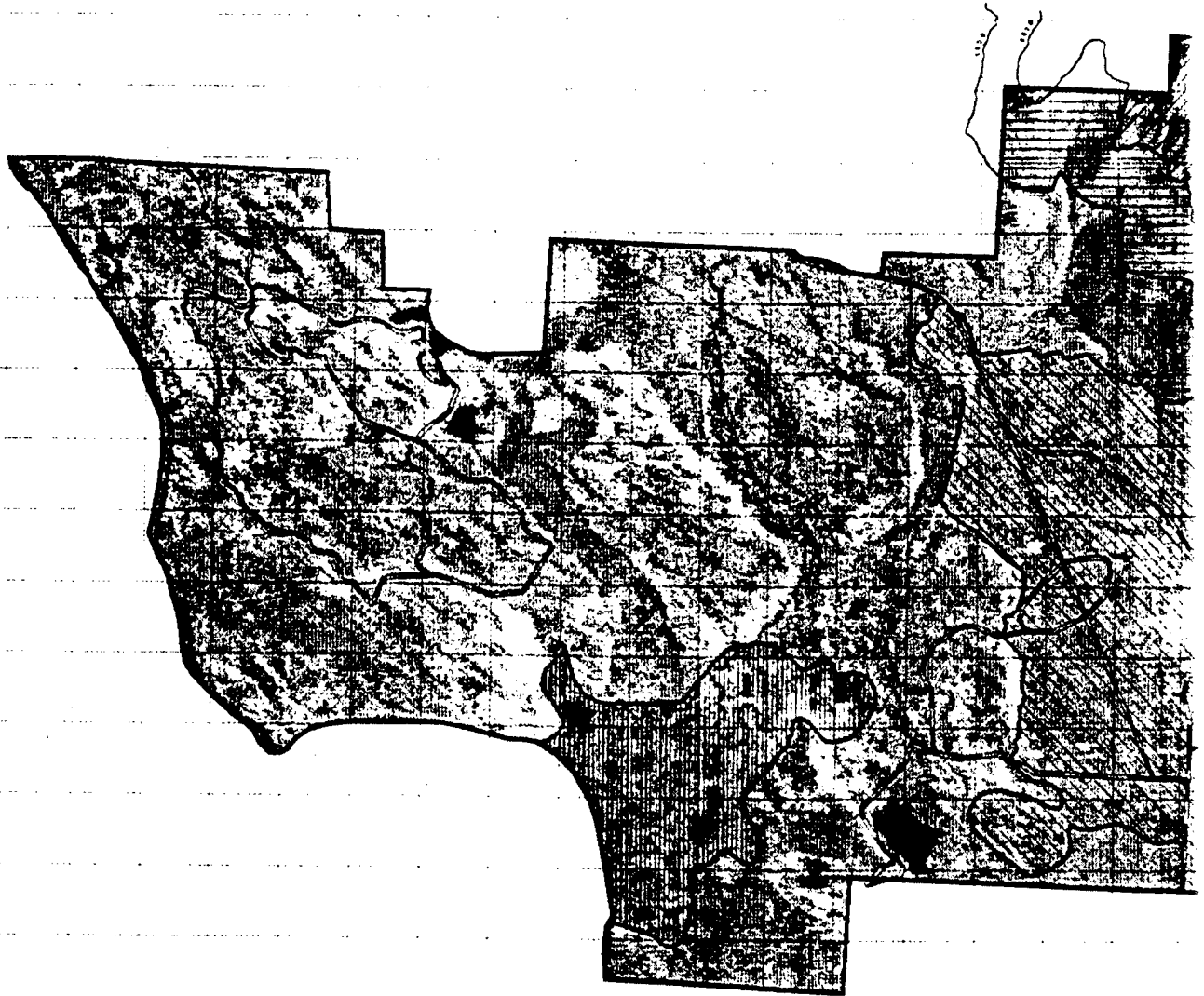
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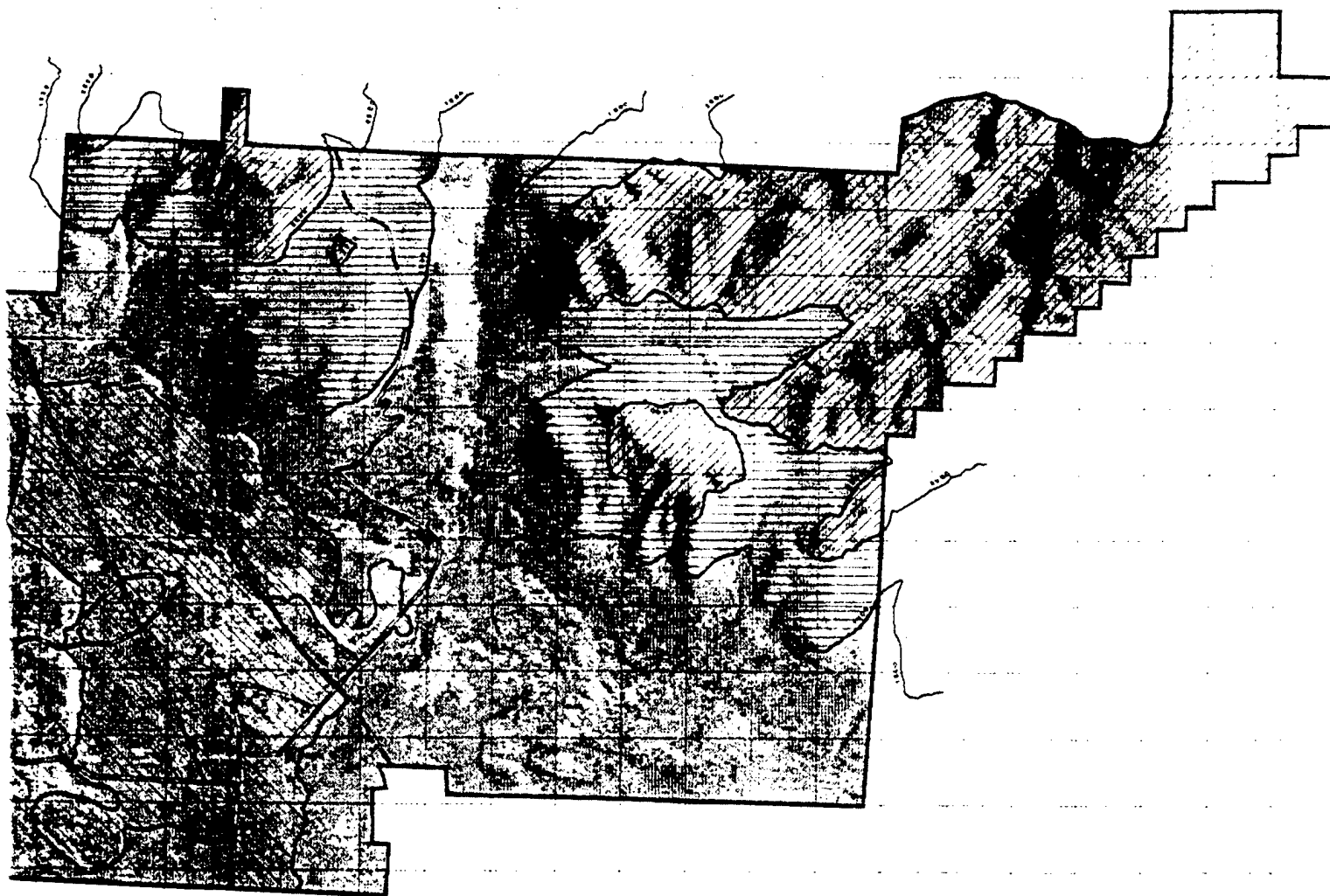
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# Fort Richardson, Alaska Vegetation Zones



(2)



Lowland Interior Forest

Coastal Halophytia

Sub-Alpine (1500 ft - 2500 ft)

Alpine (> 2500 ft)

Disturbed or Artificially Cleared

Roads

Universal Transverse Mercator

Zone 8

Datum NAD27

(3)

Universal Transverse Mercator  
Zone 6  
Datum NAD27

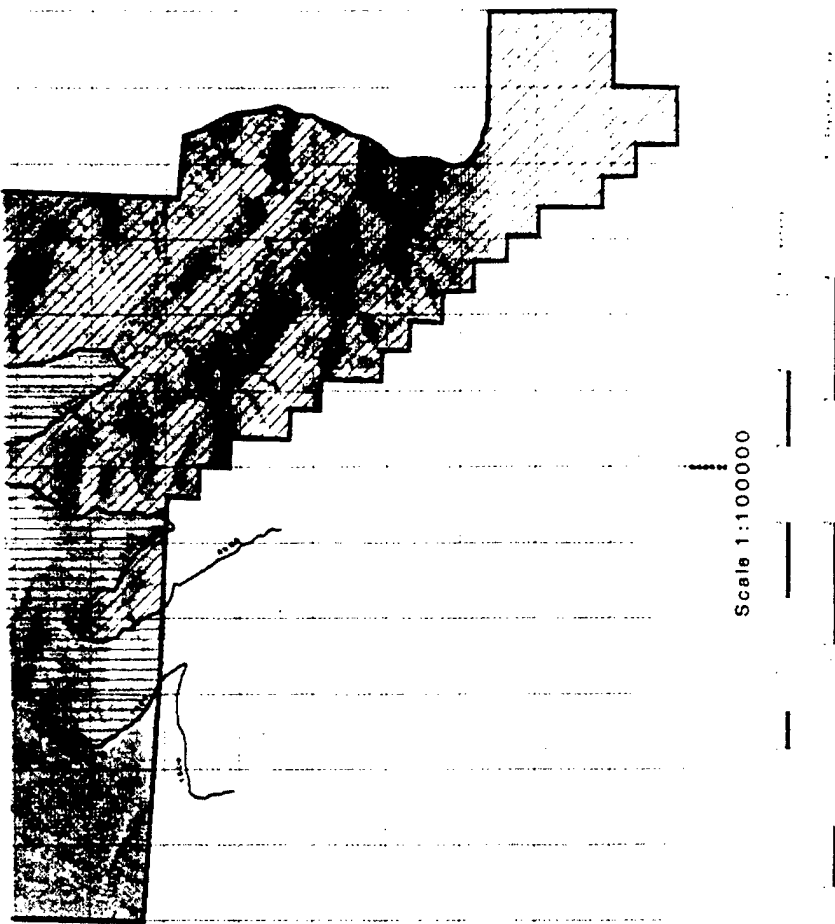
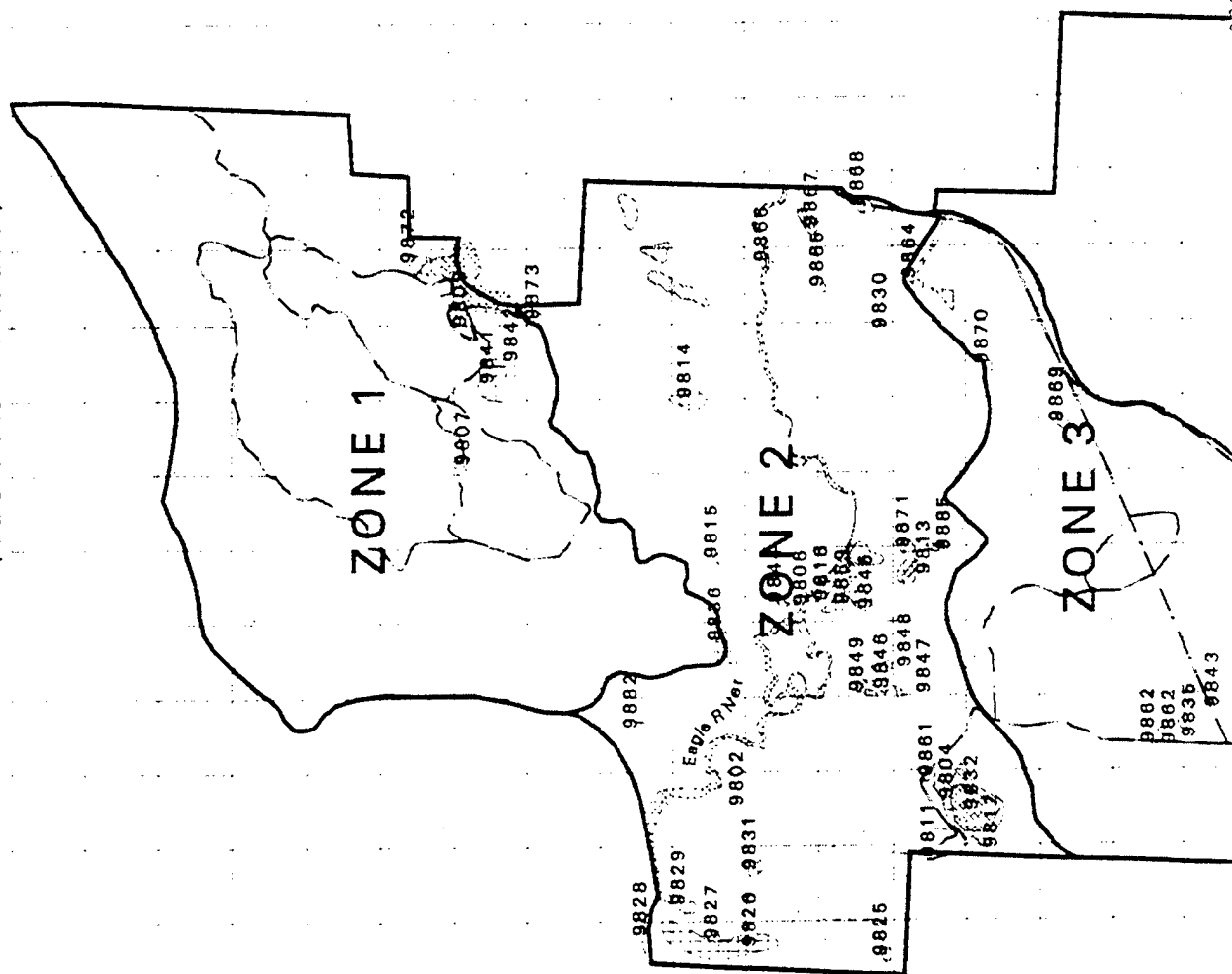


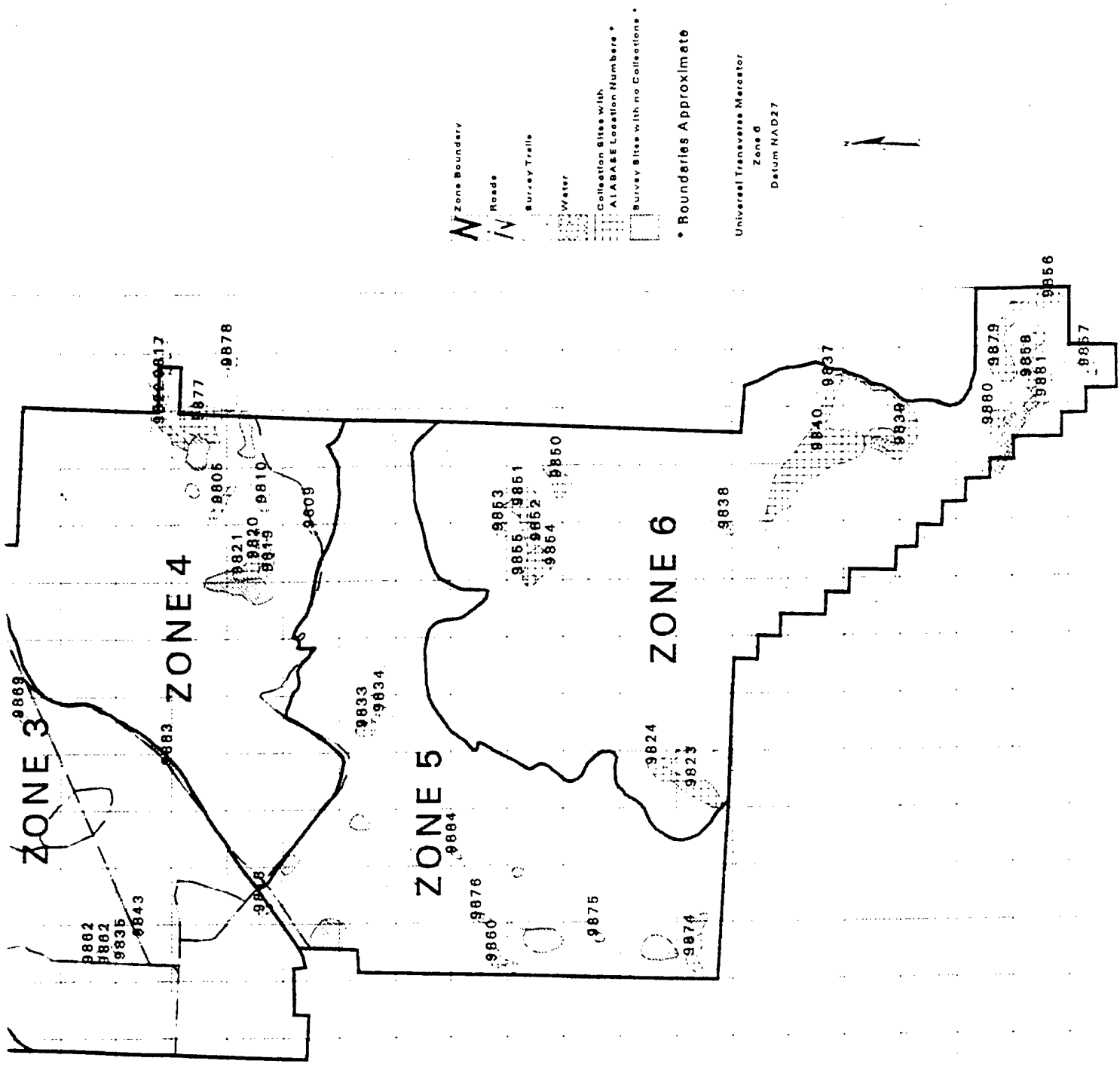
Plate 1. Fort Richardson, Alaska vegetation zones

Fort Richardson, Alaska  
Vascular Plant Collection Sites  
(1994 Field Season)





(2)



Scale 1:100000

(3)

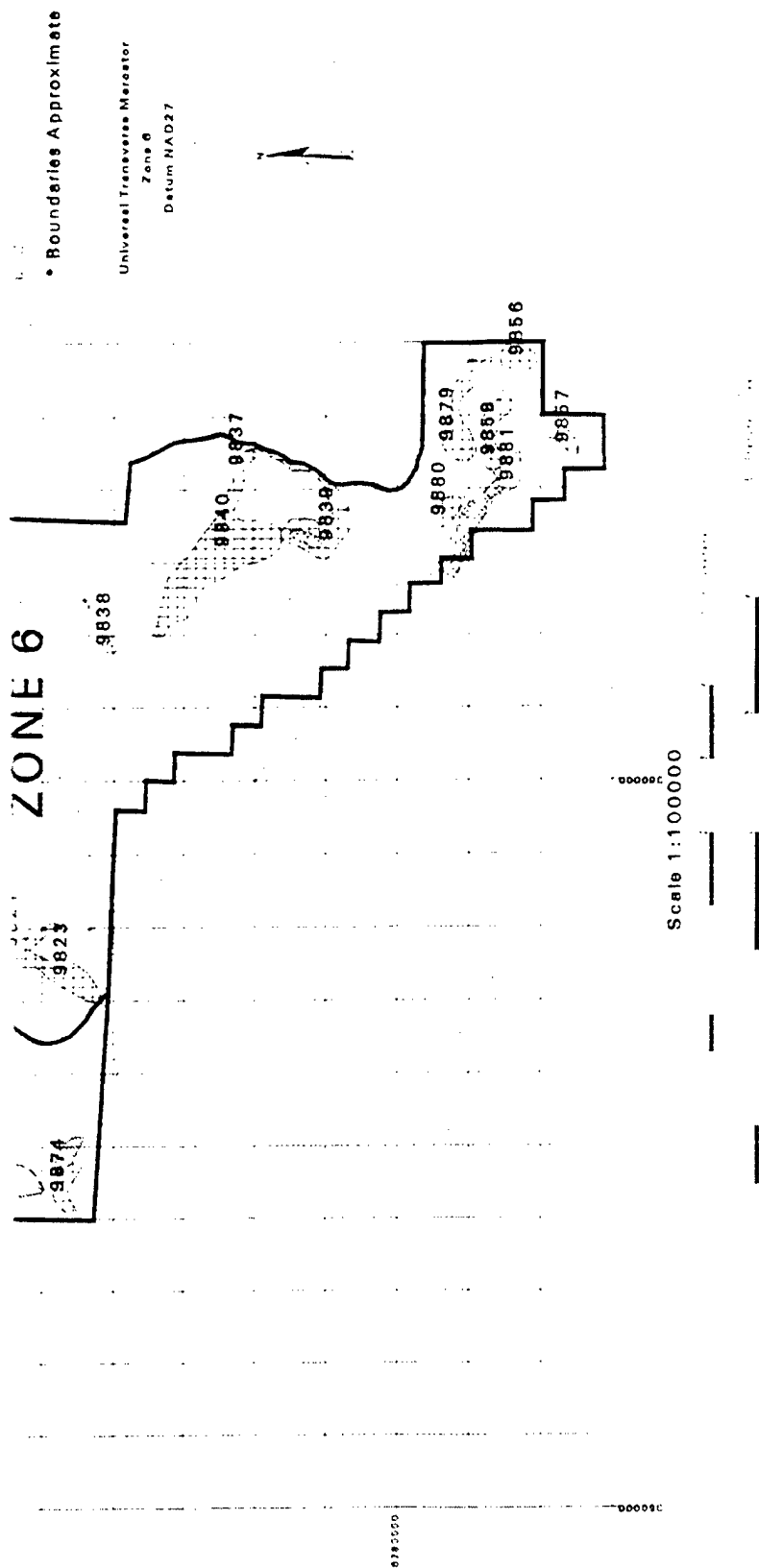


Plate 2. Vascular and cryptogam plant collection sites

# **Appendix A**

## **Vegetation of Fort Richardson**

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Prepared by Gerry Tande

## **Past Vegetation Studies in the Cook Inlet Region**

Very few vegetation studies have been conducted on or in the vicinity of Fort Richardson Military Reservation (FRA) even though the Anchorage area accounts for nearly half the population of Alaska. Henley et al. (1955) completed a timber inventory and map of FRA (updated 1962) as part of a natural resources inventory; however, only rudimentary vegetation descriptions were provided, and no inventories were conducted in nonforested types such as treeless bog or alpine areas. Racine (1994) has described the Eagle River Flats estuarine wetland zones and associated plant communities. Detailed descriptions are provided in terms of their composition, spatial patterns and processes, and comparisons are made to other estuarine wetland complexes in Alaska.

The alpine and subalpine zones are the least studied areas of FRA. A series of permanent vegetation plots, however, has been established in the Chugach Mountains as part of a climate change study. These are anticipated to provide some level of vegetation description for upper subalpine and alpine portions of the base (D. Walker, Univ. of Colorado, in progress).

Vegetation of the Anchorage area has been described by Tande (1983) for Elmendorf Air Force Base (EAFB); subalpine forest types are currently being described for the Chugach National Forest by DeVelice et al. (1994). A number of wetland studies have been completed within the Municipality (FUGRO 1981, Municipality of Anchorage 1982, Dowl Engineers 1983, Hogan and Tande 1983, Tande 1988); Potter Marsh (Batten et al. 1978, McCormick and Pinchon 1978); and Birchwood area (Frohne 1953).

Southcentral Alaskan wetlands have also been studied at Palmer Hayflats north of the base (Batten et al. 1978, Ritchie et al. 1981) and Susitna Flats across Knik Arm to the west (Sellers 1979, Snow 1982, Snow and Vince 1984, Vince and Snow 1979, 1984). Many of these studies are broadly applicable to the lowland forests and treed and treeless bogs and marshes in the Anchorage vicinity.

No alpine vegetation investigations have been completed for the Chugach Mountain Range of southcentral Alaska; Barker (1977) and Marvin (1986), however, have conducted floristic inventories with information applicable to FRA. Long term ecophysiological studies of trees at treeline have also been carried out in the subalpine zone above Anchorage (S. Bjornson University of Alaska, Anchorage). Additional vegetation-related studies with information potentially applicable to FRA is listed in Table 1.

<b>Table 1</b> <b>Vegetation or vegetation-related studies with information potentially applicable to Fort Richardson Military Reservation Alaska</b>		
<b>Susitna River Basin</b>	<b>Kenai Peninsula</b>	<b>Alaska, General</b>
USDA (1986)	Batten (1979)	Batten et al. (1978)
Acres American (1983)	Crow & Koppen (1977)	Batten (1986)
Clausen & Matthews (1988)	DeVelice (1994)	Dachnowski-Stokes (1941)
Div. of Habitat (1986)	Davis et al. (1980)	Eco. Steering Comm. (1992)
Div. of Habitat (1988)	Hjeljord (1971)	Foote (1976)
Env. Research (1984)	Jorgenson & Berg (1987)	Foote (1983)
Hanson (1951)	Krasnow & Halpin (1981)	Hall (1988)
Hegg (1970)	Neiland (1971)	Hanson (1958)
Helm (1982)	Oldemeyer & Regelin (1984)	Lee et al. (1982)
Helm (1984)	Piper (1905)	Lensink & Rothe (1986)
McKendrick et al. (1982)	Quimby (1972)	Lutz (1956)
Michaelson (1992)	Reynolds (1989)	Mitchell (1968)
Pegau (1972)	Rosenberg (1989)	Mitchell & Evans (1966)
Reed & Harms (1956)	Seguin (1979)	Neiland & Viereck (1977)
Setzer et al. (1984)	Seguin & Mangan (1977)	Selkregg et al. (1972)
SCS (1986)	Talbot et al. (1985)	Selkregg (1975)
Steigers et al. (1983)	WAES (1981)	Sjors (1985)
Talbot et al. (1992)		Van Hees (1990)
Zazada et al. (1981)		Viereck (1975)
		Viereck (1979)
		Viereck et al. (1986)
		Viereck et al. (1992)

### **Vegetation of Fort Richardson Military Reservation**

Fort Richardson falls within the Cook Inlet Lowlands Section of the Coastal Trough Humid Taiga Province of Bailey's Ecoregions of the United States (McNab et al. 1994). Vegetation of this region is a transition between a Pacific coast, western hemlock-Sitka spruce (*Tsuga heterophylla*-*Picea sitchensis*) forest and the

interior boreal forest (taiga). It has been variously described as an open, low-growing spruce forest type by Viereck and Little (1972), and as a lowland spruce-hardwood forest by the JFSLUPCA (1973).

Packee (1994), in examining Alaska's forest vegetation zones, characterizes the region as an area where white spruce (*Picea glauca*) and Sitka spruce (*Picea sitchensis*) naturally hybridize; balsam poplar (*Populus balsamifera*) and black cottonwood (*Populus trichocarpa*) intergrade; and mountain hemlock (*Tsuga mertensiana*) may form the subalpine forest. Vegetation reflects the transitional nature of the climate between maritime and continental. This maritime climatic influence has resulted in a lower incidence of natural fire than the spruce-hardwood forests of interior Alaska (Gabriel and Tande 1983).

The plant species associations of the upper Cook Inlet area, including FRA, appear to be more closely aligned with Viereck and Little's (1972) description for closed spruce-hardwood forest. Upland sites are dominated by paper birch (*Betula papyrifera*), white spruce, and, on drier sites, quaking aspen (*Populus tremuloides*). South along Turnagain Arm, however, the most common tree is Sitka spruce.

Cottonwood and poplar are common in areas bordering principal streams. Black spruce (*Picea mariana*) is the dominant tree in wetter areas and on some well-drained sites. Most bogs are treeless or support stands of stunted black spruce. Grasses, herbs, willows, and alders dominate the vegetation in a narrow band along the Inlet and at elevations above 1,500 ft (450 m) in the Anchorage area.

White spruce, mountain hemlock and, to a lesser extent, balsam poplar, are the dominant treeline species in southcentral Alaska (Viereck 1979, Viereck et al. 1992). At upper elevations, graminoid forb meadows, alder, and dwarf birch (*Betula glandulosa/nana*) thickets give way to low-growing alpine vegetation in the Chugach Mountains.

Fort Richardson Military Reservation is a topographically diverse area varying from mudflats inundated by the tides of Cook Inlet to peaks of over 5,300 ft (1650 m). Many different vegetation communities are represented, from coastal salt marsh and boreal forest types to high alpine tundra, talus slopes and blockfields. The following five zones of vegetation and plant habitats were recognized for the purposes of the floristic inventory: Figure 2 shows the general location of these five zones.

**COASTAL HALOPHYTIC ZONE** influenced by salt water, principally including shoreline tidal flats and the 865 ha Eagle River Flats estuarine marsh on Cook Inlet.

**LOWLAND INTERIOR FOREST ZONE** of boreal forest habitats below approximately 1,500 ft (460 m). Mesic to dry forest types include: white spruce; white spruce-paper birch; paper birch; white spruce-cottonwood; black cottonwood; balsam poplar; and quaking aspen. Wetlands are predominantly black spruce treed bogs and treeless bogs with a variety of low shrub and graminoid forb communities. Alder shrub is a dominant type of the Lowland Interior Forest Zone.

**SUBALPINE ZONE** of forest, shrub, and meadow habitats from approximately 1,500 ft (460 m) elevation to treeline. Mesic to dry sites include white spruce; white spruce-paper birch; balsam poplar; and mountain hemlock. Forests are interspersed with alder shrub and grass forb meadows. Treeless bogs are occasionally present in the Subalpine Zone.

**ALPINE ZONE** consists of mountain landscape habitats above treeline. Low shrubs and dwarf shrubs occupy wet and mesic to dry habitats. The latter include mesic to dry vegetated sites and dry non-vegetated sites such as rock talus and blockfields. Wetter habitats include late-melting snowfields and snowbeds.

**ARTIFICIALLY CLEARED OR DISTURBED ZONE** of the Cantonment Area, powerlines, roadsides, railroad right-of-ways, borrow pits and other human-modified areas.

### **Halophytic Zone**

This zone is found along the shores of Knik Arm and is influenced by the rise and fall of the tides. It includes tidal flats and estuarine marshes.

**Tidal Flats.** These exist below the steep forested bluffs and are regularly inundated by high tides. They are usually unvegetated except for a moss-like marine alga (*Ulva* spp.) that is evident from mid-July into the autumn as a brilliant green swath at low tide. Sparse stands of rye grass (*Leymus mollis*) and lyngbye sedge (*Carex lyngbyei*) may grow on the flats; however, the tidal deposits of gravels, sand and clay are generally barren of terrestrial vegetation.

**Estuarine Marsh.** Eagle River Flats represents one of the largest estuarine marshes along the eastern shores of Cook Inlet. Estuarine marshes are wetlands influenced by marine tidal water in river estuaries or connecting bays where tidal flats, channels and pools are periodically inundated by water of varying salinity. Although the areas are a few feet above the level of the average tides, they are occasionally flooded by exceptionally high tides and by the overflow from freshwaters of Eagle River.

Complicated vegetation patterns result from this complex interaction between oceanographic, biological, geological, chemical and hydrological processes. The vegetation of Eagle River Flats, like that of many estuarine marshes, exhibits zonal patterns that are relatively well defined and arranged in relation to both the coastline of Knik Arm and the estuarine channel of Eagle River. These zones and their respective plant communities identified by Racine (1994), are briefly described below.

Mudflats make up about 30% of Eagle River Flats and occur coastally and inland along the lower estuarine channel of the river. Barren mudflats are characterized by scattered plants of glasswort (*Salicornia europaea*), alkali grass (*Puccinellia hultenii*) and maritime arrow grass (*Triglochin maritima*). Vegetated mudflats are covered by maritime arrow grass, goose tongue (*Plantago maritima*) or beach rye communities. Arrow grass communities occur at slightly lower elevations than the elevated goose tongue and beach rye types. The former two communities are nearly pure whereas levees of beach rye have understories of silverweed (*Potentilla egedii*), goose tongue and small amounts of arrow grass.

Scattered elevated mounds and ridges occur sporadically on the Flats and are covered by a dense grass forb type. Species include *Calamagrostis* spp., *Hordeum brachyantherum*, beach pea (*Lathyrus palustris*), blue flag (*Iris setosa*), beach lovage (*Ligusticum scoticum*), *Chrysanthemum arcticum*, sweetgale (*Myrica gale*), shooting star (*Dodecatheon pulchellum*) and *Salix ovalifolia*.

A *Carex ramenskii* sedge meadow covers gully banks and separates vegetated mudflats from a pond/marsh complex roughly paralleling the lower estuarine channel of the river. Arrow grass, silverweed and *Atriplex gmelini* are associated species in the lawnlike growth of Ramenskii's sedge.

*Carex lyngbaei* sedge marsh is perhaps the dominant vegetation type on Eagle River Flats. Patches of it surround the numerous ponds inland from the Ramenskii sedge meadow. Lyngbaei sedge marsh extends S and E from the EOD Pad constituting approximately 30% of the Flats. This nearly monospecific type includes understory species of silverweed and *Stellaria humifusa*.

A low, brownish, emergent bulrush (*Scirpus paludosus*) forms extensive stands of its own or forms thin stands in some ponds found within the *Carex lyngbyaei* sedge marsh. A tall, green, great bulrush (*S. validus*) community is more restricted to borders around the deeper, mostly freshwater ponds closer to the uplands.

Floating sedge forb mats occur along the east side of the Flats bordering the uplands. Relatively low salinities support *Carex mackenzii*, *C. pleuriflora*, *C. aquatilis*, spike rush (*Eleocharis uniglumis*), water hemlock (*Cicuta mackenzieana*), marsh arrow grass (*Triglochin palustris*) and bedstraws (*Galium* spp.). Heavy mats



of submerged aquatic vegetation characterize deep ponds (e.g., horned pondweed (*Zannichellia palustris*), pondweed (*Potamogeton pectinatus*). Emergents in these estuarine marsh ponds include emergent bulrush and four-leaved marestail (*Hippuris tetraphylla*).

### Lowland Interior Forest Zone

Lower elevation upland forests extending from the Stuckagain Heights and EAFB boundaries and eastward to the foothills are largely young (< 100 yr old) paper birch and mixed older-growth (> 200 yr old) white spruce-paper birch forests.

**White Spruce-Paper Birch Forest.** The dominant vegetation type of FRA is a mixed forest of white spruce-paper birch. Nearly all of the higher elevation forested area of the Foot Hills from the Glenn Highway to treeline consists of this forest type. Large patches occupy the ground moraine coastally and south of Eagle River Flats along the EAFB boundary; uplands of the Elmendorf Moraine N of the Cantonment Area SW and NE of Fossil Creek; Eagle River bottomlands extending upstream from Eagle River Flats; and uplands NE of Eagle River Flats extending to Artillery Road and bisected by Route Bravo Road. Large patches of white spruce-paper birch also occur along the N-NE boundary N of Clunie Lake. The largest area of this forest type covers most of the large promontory of land N of Eagle Bay and W of Engineer Expressway.

This type is similar to the Old Growth Birch-White Spruce Closed Mixed Forest and Mixed Forest with Alder on EAFB (Types 8,9; Tande 1983). These birch and spruce are well-spaced and large (17-24 in DBH (43-61 cm)), and range in age from 150-225 yr.

Fungal decay of birch and insect damage in spruce have weakened many trees. Consequently, winds have caused extensive blowdowns in portions of these forests. The forest floor is generally littered with dead and downed individuals in all stages of decomposition, hampering travel in this vegetation type. Hummocky microrelief has resulted from numerous blown down trees where the root systems have been tipped up and revegetated. The forest type is interspersed with numerous, small, circular (< 200 m dia), nonforested depressions. Runoff collects in these wetland depressions and standing water may remain into early summer. These sites are dominated by dense stands of alder (*Alnus tenuifolia*, *A. sinuata*), devil's club (*Oplopanax horridus*) and/or bluejoint grass (*Calamagrostis canadensis*).

Old-growth spruce-birch forest may be open and park-like, and the understory may be dominated by low herbs and feathermoss. Pure carpets of oak fern, dwarf dogwood (*Cornus canadensis*), twinflower (*Linnaea borealis*) and

feathermoss cover the forest floor and decomposing trees. Associated herb and grass species include: bluejoint grass, northern starflower (*Trientalis europaea*), fireweed (*Epilobium angustifolium*), wintergreen (*Pyrola chlorantha*), liverleaf wintergreen (*P. asarifolia*), one-sided wintergreen (*Orthilia secunda*), lesser rattlesnake plantain (*Goodyera repens*), stiff clubmoss (*Lycopodium annotinum*), lowbush cranberry, and woodland horsetail (*Equisetum silvaticum*). Low shrubs include highbush cranberry (*Viburnum edule*), wild rose (*Rosa acicularis*), red elderberry (*Sambucus racemosa*), beauverd's spiraea (*Spiraea beauverdiana*), and false azalea (*Menziesia ferruginea*).

**Birch Forest.** The second most common upland forest type on FRA is a younger forest of paper birch (<125 yr old) with a distinct understory of white spruce. These forests date from fires around the turn of the century (Henley 1955) and generally occur as large, pure, even-aged stands surrounding the old-growth white spruce-paper birch mixed forest previously described. It is the dominant upland type N of the Eagle River and on the N and S sides of the Elmendorf Moraine. Birch forest is also the dominant vegetation type of low elevation forests S of the golf course extending to the Muldoon boundary.

Scattered balsam poplar occasionally complement a birch overstory; thinleaf alder (*Alnus tenuifolia*) grow into the canopy on poorly drained sites especially close to the mountains. Scattered forest openings are covered by devil's club and bluejoint grass. The birch forest understory is dominated by alder, devil's club, bluejoint grass, and patches of woodland horsetail, lady fern (*Athyrium filix-femina*) and shield fern (*Dryopteris dilatata*). Associated species include: shrubs - red elderberry, highbush cranberry, wild rose and american red currant (*Ribes triste*); herbs - dwarf dogwood, twinflower and northern star flower.

**White Spruce Forests.** These forests cover a very small portion of FRA. A 320 A (133 ha) stand is found on well-drained gravelly soils downstream from the south end of Clunie Lake. Another forest stand (130 A (89 ha)) occupies a north-facing slope of Eagle River 0.75 mi (2 km) downstream from the eastern boundary. Scattered patches of pure white spruce occur within old growth white spruce-paper birch forest. Similar spruce stands have been dated at 200-225 yr on neighboring EAFB (Tande 1983).

Understory of the old-growth spruce is open and covered by schrebers (*Pleurozeum schreberi*) and knights plume feathermoss (*Rhytidiadelphus triquetrus*) with large patches of dwarf dogwood, oak fern (*Gymnocarpium dryopteris*), and twinflower. Associated species include: widely scattered shrubs - wild rose, false azalea, red elderberry, and beauverd's spiraea; dwarf shrub - lowbush cranberry; herbs - northern star flower, liverleaf, large-flower (*Pyrola grandiflora*), and one-sided wintergreen.

**Black Cottonwood and White Spruce-Black Cottonwood Forests.** These forest types occur on the floodplains of various streams and rivers. Large stands of black cottonwood forest occupy the banks of the Eagle River from the Eagle River bridge N of the landfill downstream to the beginning of Eagle River Flats. The largest mixed forests of spruce-cottonwood occur on the Ship Creek floodplain, extending downstream from the golf course onto EAFB. Significant but smaller stands occur along Otter Creek, and along upper Chester Creek and the North Fork of Campbell Creek where they are crossed by Bulldog Trail. Stands occupy a floodplain defined by old stream terraces. Sites are generally very hummocky and crisscrossed with old stream channels that meander through coarse gravels.

These cottonwood and mixed spruce-cottonwood forests exhibit very large, widely-spaced trees. Similar forests on EAFB are reported to consist of 90 ft (28 m) cottonwood trees 28-45 in DBH (71-114 cm) interspersed among somewhat smaller white spruce (8-12 in; 20-30 cm DBH), birch, and cottonwood (5-8 in; 13-20 cm DBH). One cottonwood stump was aged at 200-215 years. Old trees have numerous fungal conks, and many old, fallen trees litter the forest floor.

Dense patches of alder and wild rose occur over a rich herb understory dominated by bluejoint grass, oak fern and woodland horsetail. Associated species include: shrubs - red raspberry (*Rubus idaeus*), lowbush cranberry, american red currant; herbs -northern bedstraw (*Galium boreale*), cow parsnip (*Heracleum lanatum*), bluebells (*Mertensia paniculata*), meadowrue (*Thalictrum sparsiflorum*), and monkshood (*Aconitum delphinifolium*).

**Quaking Aspen Forests.** These forests occur on well-drained sites at low elevation inland from the coast. The largest stands occur on coarse outwash deposits of ancient glacial drainageways such as the westerly reaches of Fossil Creek near Gwen and Kiowa Lakes. Another large aspen forest occurs as an easterly crescent around the McLaughlin Range, extending SW towards Eagle River Flats. Shorter, smaller diameter trees characterize dense aspen forest that occupies the steep, dry, south-facing slopes and ridge tops along rivers and streams. Examples include the Fossil Creek drainageway that bisects the Elmendorf Moraine north of the Cantonment Area; Eagle River bluffs E of Eagle River Flats; and various drumlin slopes on the outwash plain of the Elmendorf Moraine S of Ship Creek. Raised island-like areas of coarser materials in ancient drainageways also support aspen forest. Examples occur S of Clunie Lake.

Closed aspen forests on mesic sites exhibit similar understories to surrounding birch forests. Drier and more open sites exhibit a willow understory. A distinctive feature of this latter aspen type is a winter hedge line on the willow and aspen regeneration caused by heavy use by moose during the winter. Moose have also removed chunks of bark from aspen trees over many years of use. In many cases, this has left a blackened, browsed, bark line up to approximately 10 ft (3 m).

The dominant tall willow is Bebb's willow (*Salix bebbiana*). Low shrubs include labrador tea (*Ledum palustre groenlandicum*), rose, lowbush cranberry, crowberry (*Empetrum nigrum*) and dwarf dogwood. Herbs include lupine (*Lupinus nootkatensis*), labrador lousewort (*Pedicularis labradorica*), northern bedstraw, fireweed, ticklegrass (*Agrostis scabra*), and a number of other grass species.

**Balsam Poplar Forest.** These forests occur as pure young stands on well-drained revegetated sites of the Cantonment Area. Smaller stands of large trees occupy treeline sites on south-facing slopes of Ship Creek, Chester Creek and the North Fork of Campbell Creek drainage. Pure stands may also be found on the outwash plain along the S side of the Elmendorf Moraine.

Alder and devil's club may form a dense tall shrub layer in balsam poplar forests at treeline or on the outwash plain. The understory is dominated by a low shrub layer of highbush cranberry and american red currant, and a grass-herb layer of bluejoint grass and ferns. Associated species are similar to young birch forests.

**Alder Shrub.** An alder tall shrub type is one of the largest vegetation types on FRA and is characterized by an open to closed canopy of alder species and an understory of bluejoint grass, meadow horsetail (*Equisetum pratense*) and/or devil's club. Alder shrub occupies openings in the old-growth white spruce-paper birch forest canopy. It is the dominant vegetation near treeline where it intermingles with spruce-birch forests and graminoid forb meadows of lower elevations, and mountain hemlock groves and dwarf birch low shrub at treeline. A large expanse of this type covers the mountain slopes east of the Small Arms Range.

Alder is also a successional plant community type on old alluvial deposits of creeks and rivers, and disturbed sites such as old trails, roadways, powerlines and clearings. Alder and grass aggressively increase and exclude forest regeneration on such disturbed sites in southcentral Alaska (Hegg 1970, Neiland and Viereck 1977, Tande 1983). It has successfully colonized old roadways nearly to the top of Nike Summit (3,900 ft, 1,210 m).

Alder occurs on topographically variable sites. It may be found on flat to undulating terrain, steep hillsides and ravines. Alder forms dense pure stands in ice pits or kettle depressions on the Elmendorf Moraine. At higher elevations and in riparian zones, it occupies swampy sites and may have standing water in hummocky depressions into late summer. Alder shrub on the ground moraine and many disturbed sites, however, occurs on moderately well-drained compacted gravels.

A dense alder overstory may vary in height from 3-30 ft (3-10 m). The three most conspicuous codominants are bluejoint grass, meadow horsetail and devil's club. The understory may also include: shrubs - elderberry, red raspberry, wild

rose; herbs - oak fern, shield fern, dwarf dogwood, northern starflower, cloudberry (*Rubus chamaemorus*), marsh five finger (*Comarum palustris*) and buckbean (*Menyanthes trifoliata*). Upland forest species occur beneath alder on better drained sites and in cutover areas.

### **Lowland Interior Forest Wetlands**

Treed and treeless bogs occupy upland depressions (ice block pits), ancient glacial drainageways, streamsides, and the edges of many lakes and ponds of FRA. Black spruce forest and woodland and other low shrub and herbaceous types that dominate these wetlands change with changing moisture regimes as one moves away from open water. Tande (1983) identified eight zones of vegetation surrounding bog lakes and ponds on EAFB occupying deeper kettles and drainageways on the ground moraine. These zones are also present on FRA wetlands:

#### **Treed Bogs:**

- 1) closed black spruce forest
- 2) open black spruce forest
- 3) open black spruce dwarf tree
- 4) dwarf black spruce

#### **Treeless Bogs:**

- 5) sweet gale - ericaceous shrub
- 6) sphagnum moss floating bog mat
- 7) rooted floating emergents
- 8) open water (with/without submerged rooted aquatics)

Scattered throughout the upland forests are wet, graminoid meadows occupying small kettles or ice pit depressions. These wetlands are dominated by bluejoint grass. Slightly wetter sites have one or two zones of sedges which may surround a small pond.

### **Treed Bogs**

**Black Spruce Forest.** These forests occur on poorly-drained, cold sites although they may extend onto upland, better-drained sites and mix with their white spruce counterparts (Tande 1983). Black spruce forests may also occupy colder, north-facing slopes in low elevation forests.

The largest extents of black spruce on FRA occur along the Muldoon border; Fossil Creek bottomlands; large, poorly-drained depressions of the ground moraine SW of Eagle River Flats; and the extensive network of ancient glacial drainageways S and W of Clunie Lake. Nearly all lakes and ponds have a black

spruce forest or woodland margin. Although this forest is never flooded, large depressions near upturned trees may have standing water in late summer.

Dominant understory plants include: shrubs - thinleaf alder, prickly rose, labrador tea; dwarf shrubs - lowbush cranberry, dwarf dogwood; herbs - woodland horsetail, meadow horsetail (*Equisetum arvense*), cloudberry; mosses - schreibers feathermoss, and green sphagnum (*Sphagnum* spp.) Associated species remain the same for black spruce forests on better drained sites. Green sphagnum, however, is replaced by dry-site species including cranesbill mosses (*Dicranum* spp.) and reindeer lichens (*Cladonia* spp., *Cladina* spp.).

**Black Spruce Woodland.** Treed bogs grade from a closed canopy of tall black spruce to more widely-spaced trees of less stature (10-16 ft, 3-5 m). The latter sites become wetter with standing water between frost-heaved hummocks; peat may be saturated to the surface year round. Dominant species include: trees - black spruce; shrubs - labrador tea, shrubby black spruce; dwarf shrubs - lowbush cranberry; herbs - cloudberry; mosses - green sphagnum, schreber feathermoss. As the canopy becomes less dense, horsetails and feathermoss decrease, and labrador tea, shrubby spruce and green sphagnum increase. Thinleaf alder and bluejoint grass may be important components of this type as in the wildlife viewing areas on the S and E sides of Otter Lake.

This black spruce woodland grades to scattered small patches of prostrate black spruce and low, matted, dwarf shrubs covering a hummocky sphagnum peat. The peat mat is dry to saturated but rarely flooded in mid-summer. This is a common plant community on bog ridges (strangs).

Species composition is variable, responding to small changes in soil moisture. Black spruce, northern labrador tea and brown sphagnum (*Sphagnum fuscum*) are common but other shrubs and mosses vary. On moister sites, sweet gale, bog rosemary (*Andromeda polifolia*), green sphagnum and red sphagnum (*Sphagnum warnstorffianum*) are evident. On drier raised sites, crowberry, tufted clubrush (*Trichophorum caespitosum*), shrubby cinquefoil (*Pentaphylloides floribunda*), feathermoss and lichens are common.

### **Treeless Bogs**

**Sweetgale-Ericaceous Shrub.** Treeless bogs are predominantly covered by low shrub types dominated by sweet gale, ericaceous shrubs such as northern labrador tea (*Ledum palustre decumbens*), bog rosemary or bog blueberry (*Vaccinium uliginosum*), and sphagnum moss. These are very wet, usually with standing water between hummocks into late summer, and flooded after extended rainy periods. Water and exposed muck are not uncommon in this type.

Sweetgale-ericaceous shrub may form its own uniform **covertype**, or it may occupy ovoid to elongate depressions (flarks) between raised **bog ridges** (strangs). Sweet gale hummocks and mats within these areas are surrounded by standing water in early summer, and later by an exposed, saturated, moss-sedge peat. Tufted clubrush forms tussocks, and squarrose sphagnum (*Sphagnum squarrosum*), flat leaf and common bladderworts (*Utricularia intermedia*, *U. vulgaris macrorhiza*, *U. minor*) occupy depressions.

Associated species include tall cottongrass (*Eriophorum angustifolia*), buckbean, long-leaf and round-leaf sundew (*Drosera anglica*, *D. rotundifolia*), livid and shore sedge (*Carex livida*, *C. limosa*), maritime arrowgrass, northern asphodel (*Tofieldia coccinea*), and brown fen moss (*Thomenthypnum* spp.).

A variation of this sweet gale-dominated type has less exposed, mucky, depressional areas between hummocks and is most commonly found as a floating bog mat along lakeshores such as the SW shore of Otter Lake. Sweet gale and squarrose sphagnum are dominant but ericaceous shrubs are more important than in the first subtype. Ericaceous shrub dominants include: crowberry, dwarf birch (*Betula nana*), lowbush cranberry, and bog blueberry. Swamp horsetail (*Equisetum fluviatile*) and brown sphagnum are conspicuous codominants.

Associated species include: sweet gale, cloudberry, bog cranberry (*Oxycoccus microcarpus*), bog sedge (*Carex magellanica irrigua*), tall cottongrass, and Alaska bog willow (*Salix fuscescens*).

**Sphagnum Moss Floating Bog Mat.** Bouncy floating bog mats of sphagnum moss may occur near open water of treeless bogs. Scattered ericaceous shrubs include: dwarf birch, bog cranberry, bog rosemary, northern labrador tea. Herb diversity is generally low, but chamiss' cottongrass (*Eriophorum russeolum*), white cottongrass (*E. scheuchzeri*), rotund sedge (*C. rotundata*), shore sedge, and bog sedge may occur in dense patches. The peaty mat is springy and saturated throughout the year.

**Rooted Floating Emergents.** Rooted, floating aquatic vegetation is found in the shallow water zone (1-5 ft; 0.5-1.5 m) of all open water bodies on FRA. Dominants include yellow pond lily (*Nuphar polysepalum*), pond weeds (*Potamogeton* spp.) and maretail (*Hippuris* spp.).

**Graminoid Meadow.** Open kettle depressions of the Lowland Interior and Subalpine Zone mixed forests are sinks for seasonal runoff that support a dense bluejoint grass and sedge meadow. These hummocky, wet graminoid meadows may also occur along the upland margin of treeless bogs or lakes such as Gwen and Kiowa lakes.

They are characterized by a deep, fibrous, sedge-grass peat increasingly saturated toward the center of the depression. A zone of emergent *Carex rhynophysa* extends shoreward from the center of these depressions. Better-drained areas closer to upland forest are dominated by bluejoint grass. Associated species are marsh five-finger, marsh and woodland horsetail, chamiss' cottongrass, shore sedge, fen moss, and green sphagnum.

### Subalpine Zone

This zone covers a relatively narrow band from approximately 1500 ft (480 m) to the Alpine Zone at treeline at approximately 2500 ft (775 m). Much of the subalpine zone of the Chugach Mountains is characteristically an open to closed spruce-birch forest intermingled with large areas of alder shrub and bluejoint-forb meadows. Occasional white spruce forests may be found on north-facing slopes and the upper reaches of mountain drainages. These forests generally exhibit similar structure and species compositions to Lowland Interior old-growth spruce-birch and spruce forests as previously described. Alder, devil's club and bluejoint grass, however, are increasingly important with elevation in each of these types.

The south-facing subalpine slopes, of Arctic Valley, Chester Creek and the North Fork of Campbell Creek are considerably drier, and may be floristically quite diverse. A balsam poplar forest is common on these sites. These slopes, dominated by numerous herbaceous species and low shrubs, show strong resemblances to the understories of the Lowland Interior Forest Zone below. Shrubby species include willows (*Salix* spp.), highbush cranberry, soapberry (*Shepherdia canadensis*), raspberry, saskatoon berry (*Amelanchier alnifolia*) and juniper (*Juniperus communis*). Herbaceous species include siberian fescue (*Festuca altaica*), indian paintbrush (*Castilleja unalaschcensis*), fireweed, sage (*Artemisia* spp.), wild geranium (*Geranium erianthum*), three-tooth saxifrage (*Saxifrage tricuspidata*), jacob's ladder (*Polemonium* spp.) and field chickweed (*Cerastium* spp.).

Throughout the Subalpine Zone, alder shrub (as previously described) is interspersed with these forest types, and becomes the dominant vegetation type near treeline where it meets a mix of mountain hemlock groves and the dwarf birch low shrub of the lower alpine.

**Bluejoint Grass-Forb Meadow.** This type is also an extensive component of the Subalpine Zone. It is dominated by bluejoint reed grass although composition may vary from nearly pure stands to stands in which forbs and ferns are represented by a large number of species and form a major portion of the vegetation. A very rich meadow exists near treeline west of mile 0.5 of the Nike Summit Road. Common forbs and ferns include fireweed, shield fern, lady fern, cow parsnip, oak fern, horsetail, *Arnica* spp., watermelon berry (*Streptopus*



*amplexifolius*), larkspur (*Delphinium glaucum*), monkshood, chocolate lily (*Fritillaria camschatcensis*) wild geranium, Sitka burnet (*Sanguisorba stipulata*), harebells (*Campanula rotundifolia*) and northern starflower. Grasses other than bluejoint and various sedges may be present in minor amounts.

Occasional thickets and scattered shrubs may also be present in bluejoint-forb meadows. Common shrubs include alder, green mountain ash (*Sorbus scopulina*), red elderberry, willows and beauverd's spiraea.

**Mountain Hemlock Forest.** This species occurs singly and as dense, nearly impenetrable forest groves at the upper limits of white spruce at treeline. Mountain hemlock is at the northern limits of its range on FRA. Prostrate individuals occupy windy, exposed sites, while individuals near the center of forest patches may attain a height of 15 ft (5 m). A hummocky understory exhibits low vascular plant diversity. However, crowberry, blueberry, cassiope (*Cassiope tetragona*) and moss species may form continuous mats on the forest floor.

## **Alpine Zone**

This zone occupies mountain slopes above approximately 2500 ft (775 m) and consists of plants capable of withstanding very cold temperatures and short growing seasons. Alpine plants are generally low growing and tend to be mat-forming where moisture is not a limiting factor. However, in protected hollows, this zone can also support low thickets of willow and dwarf birch and moist meadows populated with herbaceous species. Alpine areas also include elevations so high, or environments so severe, that virtually no vascular plants are capable of surviving; vegetation can be sparse or almost non-existent on dry exposed ridges. This wide variety and combination of environmental conditions, however, may result in a relatively high species diversity. Many rare plants or species of limited distribution occur in this zone of FRA.

Major portions of the area N and W of Arctic Valley Ski Area, Snowhawk Creek Valley, the headwaters of Chester Creek, and the North Fork of Campbell Creek drainage lie within the Alpine Zone. Six broad vegetation types and plant habitats can be recognized:

- 1) Dwarf Birch Low Shrub Tundra
- 2) Crowberry/Blueberry Dwarf Shrub Tundra
- 3) Cassiope Dwarf Shrub Tundra
- 4) Dryas-Sedge-Lichen Dwarf Shrub Tundra
- 5) Snowbeds
- 6) Talus Slopes and Blockfields

**Dwarf Birch Low Shrub Tundra.** A hummocky, low shrub community of dwarf birch (*Betula glandulosa*, *B. nana*) covers a large area of the lower alpine where it mingles with alder shrub and bluejoint-herb meadows at treeline. Ericaceous shrubs are an important component and include: bog blueberry, lowbush cranberry, northern Labrador tea and crowberry. Willows become an important component on poorly drained sites and along drainages (e.g.: (*Salix lanata*, *S. glauca*, *S. planifolia*). Common herbs include Siberian fescue, bluejoint, *Hierochloe alpina* and *Carex* spp. on mesic to wet sites. Feathermosses may also be important.

**Crowberry/Blueberry Dwarf Shrub Tundra.** Most of the vegetated portion of the Alpine Zone is covered by crowberry/blueberry dwarf shrub tundra. Crowberry and blueberry intermingle; however, shallow, stony, fairly well-drained soils support blueberry tundra at slightly higher elevations than crowberry tundra. Sites are generally exposed to the wind and do not accumulate much snow in the winter but usually are not as exposed as sites supporting *Dryas* sedge-lichen tundra (Viereck et al. 1992). Crowberry tundra, on the other hand, occurs in more protected areas at slightly lower elevations on thin, well-drained, mineral soil or poorly-drained peats. It follows that these site differences support slightly different species associations.

Where crowberry is dominant, other dwarf shrubs include bog blueberry, lowbush cranberry, *Arctous alpina*, *Cassiope tetragona*, *Salix arctica*, and *Vaccinium caespitosum*. Herb cover is variable but generally provides little cover. It may include: *Luetkea pectinata*, *Acomastylis rossii*, *Arnica* spp., *Campanula* spp., *Pedicularis* spp., *Artemesia arctica*, and *Carex* spp.

Where blueberry is common, other ericaceous shrubs, especially northern Labrador tea, *Arctous rubra*, *A. alpina*, crowberry, and *Cassiope tetragona*, may be abundant or codominant. Dwarf willows also may be common. Herbs include *Hierochloe alpina*, *Bistorta vivipara*, *Anemone* spp., Siberian fescue, *Luzula* spp.; fruticose lichens may provide substantial cover.

**Cassiope Dwarf Shrub Tundra.** This tundra type occurs on moist sites, commonly on north-facing slopes, gelifluction lobes or snow accumulation areas. It is found on sites well protected by snow in winter that become snow-free in the early to middle part of the growing season (Viereck et al. 1992). This type is dominated by a complete cover of *Cassiope tetragona*. Common associated dwarf shrubs may sometimes be codominant and include lowbrush cranberry, bog blueberry, crowberry, and *Salix* spp. Herbs are minor components in this type; mosses are generally abundant. Lichens may be abundant but provide little cover (Viereck et al. 1992).

**Dryas-Sedge-Lichen Dwarf Shrub Tundra.** Exposed, wind-swept, alpine sites are dominated by species of the genus *Dryas* which form mats a few

centimeters thick and have a strong sedge and fruticose lichen component. Sedges include *Carex scirpoidea*, *C. misandra*, and *C. bigelowii*. A substantial amount of the total cover may be contributed by fruticose lichens such as *Cladonia* spp., *Cladina* spp., *Alectoria* spp., *Thamnolia* spp. and *Cetraria* spp. Other associated species may include *Salix reticulata*, *Arctous* spp., *Hierochloe alpina*, *Hedysarum* spp., *Festuca* spp., *Oxytropis nigrescens*, *Minuartia* spp., and *Saxifraga* spp. Various mosses may also grow intertwined with the dryas mat. Exposure to strong winds leads to deflation of fines and organic material producing various-sized mats or islands of vegetation along many ridges and slopes in the study area.

**Snowbeds.** These communities occur below outcrops and in depressions, steambeds or other topographic features that break the wind and allow substantial snowdrifts to accumulate. Although snowbeds may be dry late in the season, they are generally irrigated by water from late-melting snow drifts upslope (Viereck et al. 1992). The sites themselves are covered with snow through part or most of the summer. Large snowbeds occur on the westerly slopes of Nike Summit; at the heads of the valleys below Tanaina and Temptation Peaks; and the east end of Long Lake and associated rock glaciers at the head of the North Fork of Campbell Creek drainage.

Dominant species may be herbs (e.g., *Oxyria digyna*, *Koenigia islandica*, *Saxifraga rivularis*, *Cardamine bellidifolia*, *Poa arctica*, *Carex lachenalii*, *Claytonia sarmentosa*), mosses and lichens. Woody plants are absent. Cover is sparse, and much bare ground may be present.

**Talus Slopes, Rock Outcrops and Blockfields.** These habitats are sparsely vegetated with alpine herbs. A wide variety may be present with no particular dominant species. Common species may include *Draba* spp., *Saxifraga* spp., *Festuca brachyphylla*, *Potentilla* spp., *Diapensia lapponica*, *Oxyria digyna*, *Androsace* spp. and *Epilobium latifolium*. Lichens, especially crustose lichens, may be common.

### **Artificially Cleared or Disturbed Zone**

In general, vegetation on artificially cleared or disturbed sites is not well organized into discrete plant communities. Instead, the vegetation consists of a heterogenous mix of a wide variety of native and introduced plant species, the composition of which varies considerably from place to place over relatively short distances. This heterogeneity is in part due to soil and site conditions, which range from relatively undisturbed native soils, to shallow topsoil over coarse textured fill, to deep fill without topsoil. In addition, management of these areas has been a combination of varying degrees of soil disturbance, introduction and spread of numerous introduced forage plants and weeds, and natural revegetation by native plants, all coupled with periodic mowing or other forms of manmade disturbances.

Natural soils, which have been cleared long ago and subsequently received little additional disturbances, may exhibit distinct vegetation communities. These include alder shrub, bluejoint meadow, balsam poplar scrub, and a fireweed mesic forb herbaceous type described by Viereck et al. (1992) consisting of native plants characteristic of early-to-mid seral forests.

At the other extreme are periodically disturbed areas that tend to be dominated more by native and introduced weeds. Tickle grass, foxtail barley (*Hordeum jubatum*), bluegrass (*Poa pratensis*), clovers (*Trifolium* spp.), common dandelion (*Taraxicum officinale*), common groundsel (*Senecio vulgaris*), dock (*Rumex crispus*), knotweed (*Polygonum aviculare*), pineapple weed (*Matricaria matricarioides*), and a number of other species are very common.

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# **Appendix B**

## **Checklist of the Vascular Plants of Fort Richardson Military Reservation, Alaska**

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## CHECKLIST OF FORT RICHARDSON VASCULAR PLANT SPECIES - April 1995

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*Achillea millefolium* L.  
*Achillea ptarmica* L.  
*Achillea sibirica* Ledeb.  
*Acomastylis rossii* (R. Br.) E. Greene [= *Geum rossii* (R. Br.) Ser. ex DC.]  
*Aconitum delphiniifolium* DC.  
*Aconitum delphiniifolium* DC. ssp. *paradoxicum* (Reichb.) Maguire & Hult.  
*Actaea rubra* (Ait.) Willd.  
*Adoxa moschatellina* L.  
*Agrostis scabra* Willd.  
*Allium schoenoprasum* L.  
*Alnus sinuata* (Regel) Rydb. [= *A. crispa* (Ait.) Pursh ssp. *sinuata* (Regel) Hult.]  
*Alnus tenuifolia* Nutt. [= *A. incana* (L.) Moench ssp. *tenuifolia* (Nutt.) Breitung]  
*Alnus viridis* Villar ssp. *crispa* (Ait.) Loeve & Loeve [= *A. crispa* (Ait.) Pursh ssp. *crispa*]  
*Alopecurus aequalis* Sobol.  
*Alopecurus alpinus* Smith  
*Amaranthus retroflexus* L.  
*Amelanchier alnifolia* (Nutt.) Nutt.  
*Andromeda polifolia* L.  
*Anemone multifida* Poir. var. *saxicola* B. Boivan  
*Anemone narcissiflora* L. ssp. *villosissima* (DC.) Hult.  
*Anemone narcissiflora* L. var. *monantha* DC.  
*Anemone parviflora* Michx.  
*Anemone richardsonii* Hock.  
*Angelica genuflexa* Nutt.  
*Angelica lucida* E. Nels.  
*Antennaria alpina* (L.) Gaertn.  
*Antennaria friesiana* (Trautv.) Ekman  
*Antennaria friesiana* (Trautv.) Ekman ssp. *alaskana* (Malte) Hult.  
*Antennaria monocephala* DC.  
*Antennaria rosea* E. Greene ssp. *pulvinata* (E. Greene) Bayer  
*Antennaria rosea* (D.C. Eaton) E. Greene  
*Anthemis cotula* L.  
*Anthemis tinctoria* L.  
*Aphragmus eschscholtzianus* Andr.  
*Aquilegia formosa* Fisch.  
*Arabis hirsuta* (L.) Scop. ssp. *eschscholtziana* (Andrz.) Hult.  
*Arabis holboellii* Hornem.  
*Arabis lyrata* L. ssp. *kamchatica* (Fisch.) Hult.  
*Arctagrostis latifolia* (R. Br.) Griseb.

*Arctagrostis poaeoides* Nash  
*Arctogrostis latifolia* (R. Br.) Griseb. var. *arundinacea* (Trin.) Griseb.  
*Arctogrostis latifolia* (R. Br.) Griseb. var. *latifolia*  
*Arctostaphylos uva-ursi* (L.) Sprengel  
*Arctous alpina* (L.) Niedenzu [= *Arctostaphylos alpina* (L.) Spreng.]  
*Arctous rubra* (Rehd. & Wilson) Nakai [= *Arctostaphylos rubra* (Rehd. & Wilson)  
 Fern.]  
*Armeria maritima* (Mill.) Willd. ssp. *arctica* (Cham.) Hult.  
*Arnica griscomii* Fern. ssp. *frigida* (C. Meyer ex Iljin) S. J. Wolf  
*Arnica latifolia* Bong.  
*Arnica lessingii* Greene  
*Arnica ovata* E. Greene  
*Artemisia arctica* Less.  
*Artemisia tilesii* Ledeb.  
*Aster junciformis* Rydb.  
*Aster sibiricus* L.  
*Astragalus alpinus* L.  
*Astragalus alpinus* L. ssp. *alpinus*  
*Astragalus polaris* Benth.  
*Astragalus umbellatus* Bunge  
*Athyrium filix-femina* (L.) Roth  
*Atriplex gmelinii* C.A. Meyer  
*Avena fatua* L.  
*Barbarea orthoceras* Ledeb.  
*Beckmannia eruciformis* (L.) Host ssp. *baicalensis* (Kusn.) Hult.  
*Betula glandulosa* Michx.  
*Betula hybrids*  
*Betula kenaica* Evans  
*Betula papyrifera* Marshall  
*Bistorta vivipara* (L.) Gray [= *Polygonum viviparum* L.]  
*Boschniakia rossica* (Cham & Schldl.) B. Fedtsch.  
*Botrychium boreale* (E.Fries) Milde (= *Botrichium pinnatum* H. St. John ln: FNA)  
*Botrychium lanceolatum* (Gmel.) Angstr.  
*Botrychium lunaria* (L.) Sw.  
*Brassica rapa* L.  
*Bromopsis inermis* (Leyss.) Holub [= *Bromus inermis* Leyss.]  
*Bromus tectorum* L.  
*Calamagrostis canadensis* (Michx.) Beauv.  
*Calamagrostis descampsioides* Trin.  
*Calamagrostis inexpansa* Gray  
*Calamagrostis lapponica* (Wahlenb.) Hartman. F.  
*Calamagrostis nutkaensis* (C. Presl) Steudel  
*Callitriche verna* L. emend. Lonnr.  
*Caltha palustris* L. ssp. *asarifolia* (DC.) Hult.  
*Campanula lasiocarpa* Cham.

*Campanula rotundifolia* L.  
*Campanula uniflora* L.  
*Capsella bursa-pastoris* (L.) Medic.  
*Capsella rubella* Reut.  
*Cardamine bellidifolia* L.  
*Cardamine pratensis* L. ssp. *angustifolia* (Hook.) O.E. Schultz  
*Cardamine umbellata* Greene  
*Carex aquatilis* Wahlenb. ssp. *aquatilis*  
*Carex atosquama* Mackenzie  
*Carex bigelowii* Torr.  
*Carex buxbaumii* Wahlenb.  
*Carex canescens* L.  
*Carex chordorrhiza* Ehrh.  
*Carex circinata* C. A. Mey.  
*Carex deweyana* Schwein.  
*Carex diandra* Schrank  
*Carex dioica* L. ssp. *gynocrates* (Wormsk.) Hult.  
*Carex garberi* Fern. ssp. *bifaria* (Fern.) Hult.  
*Carex gmelinii* Hook. & Arn.  
*Carex kelloggii* W. Boott  
*Carex lachenalii* Schkuhr.  
*Carex lasiocarpa* Ehrh. ssp. *americana* (Fern.) Hult.  
*Carex leptalea* Wahlenb.  
*Carex limosa* L.  
*Carex livida* (Wahlenb.) Willd.  
*Carex loliacea* L.  
*Carex lyngbyei* Hornem.  
*Carex mackenziei* V. Krecz.  
*Carex macloviana* Urv.  
*Carex macrochaeta* C.A. Mey.  
*Carex magellanica* Lam. ssp. *irrigua* (Wahlenb.) Hult.  
*Carex media* R. Br.  
*Carex membranacea* Hook.  
*Carex mertensii* Prescott  
*Carex microchaeta* Holm.  
*Carex microchaeta* Holm. ssp. *nesophila* (Holm.) D. Murray  
*Carex micropoda* C.A. Meyer [= *C. pyrenaica* Wahlenb. ssp. *micropoda*  
(C. A. Meyer) Hult.]  
*Carex nigricans* C.A. Meyer  
*Carex obtusata* Lilj.  
*Carex oederi* Retz.  
*Carex pauciflora* Lightf.  
*Carex pluriflora* Hult.  
*Carex podocarpa* C.B. Clarke  
*Carex praticola* Rydb.

*Carex ramenskii* Kom.  
*Carex rariflora* (Wahlenb.) Smith  
*Carex rostrata* Stokes  
*Carex rotundata* Wahlenb.  
*Carex saxatilis* L.  
*Carex scirpoidea* Michx.  
*Carex spectabilis* Dewey  
*Carex tenuiflora* Wahlenb.  
*Carex utriculata* F. Boott  
*Carex vaginata* Tausch  
*Cassiope lycopodioides* (Pall.) D. Don  
*Cassiope stelleriana* (Pall.) DC.  
*Cassiope tetragona* (L.) D. Don  
*Castilleja unalaschcensis* (Cham. & Schlecht.) Malte  
*Cerastium arvense* L.  
*Cerastium beeringianum* Cham. & Schlecht. var. *beeringianum*  
*Cerastium fontanum* Baumg.  
*Chamaedaphne calyculata* (L.) Moench  
*Chenopodium album* L.  
*Chrysanthemum arcticum* L.  
*Chrysanthemum leucanthemum* L.  
*Chrysosplenium tetrandrum* (Lund) T. Fries  
*Cicuta douglasii* (DC.) J. Coulter & Rose  
*Cicuta virosa* L. [= *C. mackenzieana* Raup]  
*Circaea alpina* L.  
*Claytonia sarmentosa* C. Meyer  
*Coeloglossum viride* (L.) Hartm. ssp. *bracteatum* (Muhl.) Hult.  
*Comarum palustre* L. [= *Potentilla palustris* (L.) Scop.]  
*Conioselinum pacificum* (S. Wats.) Coult. & Rose [= *C. chinense* (L.) BSP.]  
*Corallorrhiza trifida* Chatel.  
*Cornus canadensis* L.  
*Cornus suecica* L.  
*Corydalis pauciflora* (Steph.) Pers.  
*Corydalis sempervirens* (L.) Pers.  
*Crepis elegans* Hook.  
*Crepis nana* Richards.  
*Crepis tectorum* L.  
*Cryptogramma acrostichoides* R. Br. [= *C. crispa* (L.) R. Br. var. *acrostichoides* (R. Br.) Clarke]  
*Cystopteris fragilis* (L.) Bernh.  
*Cystopteris montana* (Lam.) Bernh.  
*Dactylis glomerata* L.  
*Delphinium glaucum* S. Wats.  
*Deschampsia cespitosa* (L.) P. Beauv. ssp. *caespitosa*  
*Descurainia sophioides* (Fisch.) O.E. Shultz



*Diapensia lapponica* L.  
*Dodecatheon pulchellum* (Raf.) Merr.  
*Douglasia alaskana* (Cov. & Stand. ex Hult.) S. Kelso [= *Androsace alaskana* Cov. & Stand.]  
*Draba alpina* L.  
*Draba aurea* Vahl  
*Draba borealis* DC.  
*Draba cana* Rydb. [= *D. lanceolata* Royle In: Hulten]  
*Draba crassifolia* Graham  
*Draba fladnizensis* Wulf.  
*Draba glabella* Pursh  
*Draba lactea* Adams  
*Draba lonchocarpa* Rydb.  
*Draba longipes* Raup  
*Draba nivalis* Liljebl.  
*Draba ruaxes* Payson & H. St. John  
*Draba stenoloba* Ledeb.  
*Draba stenopetala* Trautv.  
*Drosera anglica* Huds.  
*Drosera rotundifolia* L.  
*Dryas alaskensis* Pors. [= *D. octopetala* L. ssp. *alaskensis* (Pors.) Hult.]  
*Dryas drummondii* Richards.  
*Dryas integrifolia* Vahl.  
*Dryas octopetala* L.  
*Dryopteris dilatata* (Hoffm.) A.Gray  
*Dryopteris fragrans* (L.) Schott  
*Eleocharis kamtschatica* (C.A. Meyer) V. Komarov  
*Eleocharis palustris* (L.) Roem. & Schult.  
*Eleocharis quinqueflora* (F. Hartmann) O. Schwarz  
*Elymus alaskanus* (Scribn. & Merr.) A. Loeve ssp. *alaskanus* [= *Agropyron violaceum* (Hornem.) Lange]  
*Elymus glaucus* Buckley  
*Elymus sibiricus* L.  
*Elymus trachycaulus* (Link) Gould ex Shinnars ssp. *andinus* (Schribner & Smith) A.  
*Elymus trachycaulus* (Link) Gould ex Shinnars ssp. *novae-angliae* (Scribn.) Tzvelev  
 [= *Agropyron pauciflorum* (Schwein.) Hitchc. ssp. *novae-angliae* (Scribn.) Meldris]  
*Elytrigia repens* (L.) Nevski [= *Agropyron repens* (L.) Beauv.]  
*Empetrum hermaphroditum* (Lange) Hagerup [= *E. nigrum* L. ssp. *hermaphroditum* (Lange) Boecher]  
*Empetrum nigrum* L.  
*Epilobium anagallidifolium* Lam.  
*Epilobium angustifolium* L.  
*Epilobium ciliatum* Raf. ssp. *glandulosum* (Lehm.) Hoch & Raven  
 [= *E. glandulosum* Lehm.]  
*Epilobium hornemannii* Reichb. ssp. *hornemannii*

*Epilobium latifolium* L.  
*Epilobium palustre* L.  
*Equisetum arvense* L.  
*Equisetum fluviatile* L. ampl. Ehrh.  
*Equisetum palustre* L.  
*Equisetum pratense* L.  
*Equisetum scirpoides* Michx.  
*Equisetum sylvaticum* L.  
*Equisetum variegatum* Schleich.  
*Erigeron acris* L.  
*Erigeron humilis* Graham  
*Erigeron peregrinus* (Pursh) Greene  
*Erigeron purpuratus* Greene  
*Eriophorum angustifolium* Honck. ssp. *subarcticum* (V. Vassiljev) Hult.  
*Eriophorum gracile* Koch  
*Eriophorum russeolum* Fries  
*Eriophorum russeolum* Fries var. *albidum* W. Nyl.  
*Eriophorum scheuchzeri* Hoppe  
*Eriophorum viridicarinatum* (Englem.) Fern.  
*Erucastrum gallicum* (Willd.) O. E. Schulz [= *Brassica erucastrum*]  
*Erysimum cheiranthoides* L.  
*Erysimum cheiranthoides* L. ssp. *altum* Ahti  
*Euphrasia disjuncta* Fern & Wieg.  
*Eutrema edwardsii* R. Br.  
*Festuca altaica* Trin.  
*Festuca brevissima* Yurtsev  
*Festuca rubra* L.  
*Festuca vivipara* (L.) Smith  
*Fragaria chiloensis* (L.) Duchesne  
*Fritillaria camschatcensis* (L.) Ker-Gawl.  
*Galeopsis bifida* Boem.  
*Galium boreale* L.  
*Galium trifidum* L. ssp. *trifidum*  
*Galium triflorum* Michx.  
*Gastrolychnis apetala* (L.) Tolm & Koz. [= *Melandrium apetalum* (L.) Fenzl.]  
*Gentiana glauca* Pallas  
*Gentianella amarella* (L.) Boerner [= *Gentiana amarella* L. ssp. *acuta* (Michx.) Hult.]  
*Gentianella propinqua* (Richards.) Gillet var. *propinqua* [= *Gentiana propinqua* Richards. ssp. *propinqua*]  
*Geocaulon lividum* (Richards.) Fern.  
*Geranium erianthum* DC.  
*Geranium pusillum* Burm.  
*Geum macrophyllum* Willd. ssp. *macrophyllum*

*Geum perincisum* Rydb. [= *Geum macrophyllum* Willd. ssp. *perincisum* (Rydb.) Raup.]  
*Glaux maritima* L.  
*Glyceria borealis* (Nash) Batch.  
*Glyceria striata* (Lam.) A. Hitchc. ssp. *stricta* (Scribn.) Hult.  
*Goodyera repens* (L.) R. Br. var. *ophioides* Fern.  
*Gymnocarpium dryopteris* (L.) Newm.  
*Hammarbya paludosa* (L.) Ktze.  
*Hedysarum alpinum* L.  
*Helianthus annuus* L.  
*Heracleum lanatum* Michx.  
*Heuchera glabra* Willd.  
*Hieracium triste* Willd.  
*Hierochloe alpina* (Sw.) Roem. & Schult.  
*Hierochloe odorata* (L.) P. Beauv.  
*Hippuris montana* Ledeb.  
*Hippuris tetraphylla* L.F.  
*Hippuris vulgaris* L.  
*Hordeum brachyantherum* Nevski  
*Hordeum jubatum* L.  
*Huperzia selago* (L.) C. Martius [= *H. haleakalae* (Brackenridge) Holub In: FNA\*]  
*Huperzia selago* (L.) C. Martius ssp. *chinense* (C. Chr.) Loeve & Loeve  
 [= *Lycopodium selago* L. ssp. *chinense* (C. Chr.) Hult.; = *H. myoshiana* (Makino) Ching In: FNA\*]  
*Impatiens noli-tangere* L.  
*Iris setosa* Pall. ssp. *setosa*  
*Isoetes echinospora* Durieu  
*Juncus alpinus* Villers  
*Juncus biglumis* L.  
*Juncus bufonius* L.  
*Juncus castaneus* Smith  
*Juncus castaneus* Sm. ssp. *castaneus*  
*Juncus castaneus* Sm. ssp. *leucochlamys* (Zinz.) Hult.  
*Juncus drummondii* E. Mey.  
*Juncus ensifolius* Wikstrom  
*Juncus mertensianus* Bong.  
*Juncus stygius* L. ssp. *americanus* (Buchenau) Hult.  
*Juncus triglumis* L.  
*Juniperus communis* L.  
*Lathyrus palustris* L. ssp. *pilosus* (Cham.) Hult.  
*Ledum groenlandicum* Oeder [= *L. palustre* L. ssp. *groenlandicum* (Oeder) Hult.]  
*Ledum palustre* L. ssp. *decumbens* (Ait.) Hult.  
*Lemna minor* L.  
*Lepidium densiflorum* Schrad.  
*Leptarrhena pyrolifolia* (D. Don) Ser.

*Leymus mollis* (Trin.) Hara ssp. *mollis* [= *Elymus arenarius* L. ssp. *mollis* (Trin.) Hult.]  
*Ligusticum scothicum* L. ssp. *hultenii* (Fern.) Cald. & Tayl.  
*Linaria vulgaris* Mill.  
*Linnaea borealis* L.  
*Listera cordata* (L.) R. Br.  
*Lloydia serotina* (L.) Rchb.  
*Loiseleuria procumbens* (L.) Desv.  
*Lolium multiflorum* Lam.  
*Luetkea pectinata* (Pursh) Ktze.  
*Lupinus nootkatensis* Donn  
*Lupinus polyphyllus* Lindl.  
*Luzula arcuata* (Wahlenb.) Sw.  
*Luzula arcuata* (Wahlenb.) Sw. ssp. *unalaschensis* (Buchenau) Hult.  
*Luzula confusa* Lindeb.  
*Luzula multiflora* (Retz.) Lej. var. *frigida* (Buchenau) Hult.  
*Luzula parviflora* (Ehrh.) Desv.  
*Luzula spicata* (L.) DC.  
*Luzula wahlenbergii* Rupr.  
*Lycopodium alpinum* L. [= *Diphasiastrum alpinum* (L.) Holub In: FNA\*]  
*Lycopodium annotinum* L.  
*Lycopodium clavatum* L. ssp. *monostachyon* (Grev. & Hook.) Sel. [= *L. lagopus* (Laest. ex C. Hartman) In: FNA\*]  
*Lycopodium complanatum* L. [= *Diphasiastrum complanatum* (L.) Holub In: FNA\*]  
*Lycopodium sabinifolium* Willd. var. *sitchense* (Rupt.) Fern. [= *Diphasiastrum sitchense* (Ruprecht) Holub In: FNA\*]  
*Lysimachia thyrsiflora* L.  
*Malaxis monophyllos* (L.) Sw. var. *brachypoda* (A. Gray) Morris & Ames  
*Matricaria matricarioides* (Less.) Porter  
*Matteuccia struthiopteris* (L.) Tod.  
*Medicago falcata* L.  
*Medicago sativa* L.  
*Melandrium noctiflorum* (L.) Fries  
*Melilotus albus* Desr.  
*Melilotus officinalis* (L.) Lam.  
*Mentha arvensis* L.  
*Menyanthes trifoliata* L.  
*Menziesia ferruginea* Sm.  
*Mertensia paniculata* (Ait.) G. Don  
*Mimulus guttatus* DC.  
*Minuartia biflora* (L.) Sching & Thell.  
*Minuartia macrocarpa* (Pursh) Ostenf.  
*Minuartia rubella* (Wahlenb.) Graebn.  
*Mitella pentandra* Hook.  
*Moehringia lateriflora* (L.) Fenzl

*Moneses uniflora* (L.) Gray  
*Myosotis alpestris* F. W. Schmidt  
*Myrica gale* L.  
*Myriophyllum exalbescens* Fern. [= *M. spicatum* L.]  
*Myriophyllum verticillatum* L.  
*Najas flexilis* (Willd.) Rost. & Schmidt  
*Nuphar polysepala* Engelm.  
*Oplopanax horridus* (Smith) Miquel [= *Echinopanax horridum* (Sm.) Decne. & Planch.]  
*Orthilia secunda* (L.) House [= *Pyrola secunda* L. ssp. *secunda*]  
*Osmorhiza depauperata* Phill.  
*Oxycoccus microcarpos* Turcz. ex Rupr.  
*Oxyria digyna* (L.) Hill  
*Oxytropis bryophila* (E. Greene) Yurtsev  
*Oxytropis huddelsonii* Pors.  
*Oxytropis maydelliana* Trautv.  
*Oxytropus varians* (Rydb.) Schumann  
*Papaver alboroseum* Hult.  
*Papaver nudicaule* L.  
*Papaver radicum* Rottb. ssp. *radicum*  
*Parnassia kotzebuei* Cham. & Schlecht.  
*Parnassia palustris* L.  
*Parnassia palustris* L. ssp. *neogaea* (Fern.) Hult.  
*Pedicularis capitata* Adams.  
*Pedicularis labradorica* Wirsing  
*Pedicularis lanata* Cham. & Schlecht  
*Pedicularis langsдорffii* Fisch. ex Steven  
*Pedicularis verticillata* L.  
*Pentaphylloides floribunda* (Pursh.) Loeve [= *Potentilla fruticosa* L.]  
*Petasites frigidus* (L.) Franchet  
*Petasites sagittatus* (Banks) Gray  
*Phalaris arundinacea* L.  
*Phleum commutatum* Gaudin var. *americanum* (Fourn.) Hult.  
*Phleum pratense* L.  
*Phyllodoce aleutica* (Spreng.) A. A. Heller  
*Picea glauca* (Moench) Voss  
*Picea mariana* (Mill.) Britt., Sterns & Pogg  
*Pinguicula villosa* L.  
*Plantago major* L. var. *major*  
*Plantago maritima* L. ssp. *juncoides* (Lam.) Hult.  
*Platanthera dilatata* Pursh  
*Platanthera hyperborea* (L.) Lindl. var. *hyperborea*  
*Platanthera hyperborea* (L.) Lindl. var. *viridiflora* (Cham.) Luer  
*Platanthera obtusata* (Pursh) Lindl.  
*Poa alpigena* (E. Fries) Lindm.

*Poa alpina* L.  
*Poa annua* L.  
*Poa arctica* R. Br.  
*Poa eminens* Presl  
*Poa glauca* M. Vahl.  
*Poa palustris* L.  
*Poa paucispicula* Scribn. & Merr.  
*Poa pratensis* L.  
*Poa psuedoabbreviata* Rosh.  
*Polemonium acutiflorum* Willd.  
*Polemonium pulcherrimum* Hook.  
*Polygonum amphibium* L.  
*Polygonum aviculare* L.  
*Polygonum convolvulus* L.  
*Polygonum fowleri* Robins.  
*Polygonum lapathifolium* L.  
*Polygonum pensylvanicum* L. ssp. *oneillii* (Brenckle) Hult.  
*Populus balsamifera* L.  
*Populus balsamifera* L. ssp. *balsamifera*  
*Populus balsamifera* L. ssp. *trichocarpa* (Torr. & Gray) Brayshaw  
*Populus tremuloides* Michx.  
*Potamogeton alpinus* Balb.  
*Potamogeton epihydrus* Raf.  
*Potamogeton filiformis* Pers.  
*Potamogeton gramineus* L.  
*Potamogeton natans* L.  
*Potamogeton pectinatus* L.  
*Potamogeton praelongus* Wulf.  
*Potamogeton richardsonii* (A. Bennett) Rydb. [= *P. perfoliatus* L. ssp. *richardsonii* (A. Bennett) Hult.]  
*Potamogeton vaginatus* Turcz.  
*Potamogeton zosterifolius* Schum.  
*Potentilla anserina* L.  
*Potentilla diversifolia* Lehm.  
*Potentilla egedii* Wormsk. ssp. *grandis* (Torr. & Gray) Hult.  
*Potentilla hyparctica* Malte  
*Potentilla multifida* L.  
*Potentilla norvegica* L.  
*Potentilla uniflora* Ledeb.  
*Primula cuneifolia* Ledeb. ssp. *saxifragifolia* (Lehm.) Smith & Forrest  
*Puccinellia grandis* Swallen  
*Puccinellia nutkaensis* (Presl) Fern. & Weath.  
*Puccinellia phryganodes* (Trin.) Scribner & Marr.  
*Pyrola asarifolia* Michx.  
*Pyrola asarifolia* Michx. var. *purpurea* (Bunge) Fern.

*Pyrola chlorantha* Sw.  
*Pyrola minor* L.  
*Ranunculus arbortivus* L.  
*Ranunculus cymbalaria* Pursh  
*Ranunculus eschscholtzii* Schlecht.  
*Ranunculus gmelinii* DC. ssp. *gmelini*  
*Ranunculus hyperboreus* Rottb.  
*Ranunculus lapponicus* L.  
*Ranunculus macounii* Britt.  
*Ranunculus nivalis* L.  
*Ranunculus occidentalis* Nutt.  
*Ranunculus pygmaeus* Wahl.  
*Ranunculus sceleratus* L. ssp. *multifidus* (Nutt.) Hult.  
*Ranunculus trichophyllus* Chaix  
*Ranunculus trichophyllus* Chaix var. *trichophyllus*  
*Rhinanthus minor* L.  
*Rhodiola integrifolia* Raf. [= *Sedum rosea* (L.) Scop. ssp. *integrifolia* (Raf.) Hult.]  
*Ribes hudsonianum* Richards.  
*Ribes laxiflorum* Pursh  
*Ribes triste* Pall.  
*Romanzoffia sitchensis* Bong.  
*Rorippa barbareaifolia* (DC.) Kitigawa  
*Rorippa palustris* (L.) Besser ssp. *hispida* (Desv.) Jonsell  
*Rorippa palustris* (L.) Besser ssp. *palustris*  
*Rorippa sylvestris* (L.) Besser  
*Rosa acicularis* Lindl.  
*Rosa nutkana* Presl  
*Rubus arcticus* L.  
*Rubus chamaemorus* L.  
*Rubus idaeus* L.  
*Rubus pedatus* Sm.  
*Rubus stellatus* Sm. [= *R. arcticus* L. ssp. *stellatus* (Sm.) Boiv. emend. Hult.]  
*Rumex acetosella* L.  
*Rumex arcticus* Trautv.  
*Rumex crispus* L.  
*Rumex fenestratus* Greene  
*Rumex transitorius* K. H. Resch  
*Ruppia spiralis* L.  
*Sagina nivalis* (Lindblom) Fries  
*Sagina saginoides* (L.) Karst.  
*Salicornia europaea* L.  
*Salix alaxensis* (Anderss.) Cov.  
*Salix arctica* Pall.  
*Salix barclayi* Anderss.

*Salix bebbiana* Sarg. [= *S. depressa* L. ssp. *rostrata* (Anderss.) Hiitonen]  
*niphoclada*  
*Salix brachycarpa* Nutt. ssp. *niphoclada* (Rydb.) Argus  
*Salix fuscescens* Anderss.  
*Salix glauca* L.  
*Salix lucida* Muhl. ssp. *lasiandra* (Benth.) Argus [= *S. lasiandra* Benth.]  
*Salix ovalifolia* Trautv.  
*Salix planifolia* Pursh ssp. *pulchra* (Cham.) Argus [= *S. pulchra* Cham.]  
*Salix reticulata* L.  
*Salix rotundifolia* Trautv.  
*Salix scouleriana* Barratt  
*Salix sitchensis* Sanson  
*Sambucus racemosa* L.  
*Sanguisorba stipulata* Raf.  
*Saxifraga adscendens* L.  
*Saxifraga bronchialis* L.  
*Saxifraga cespitosa* L.  
*Saxifraga calycina* Sternb.  
*Saxifraga cernua* L.  
*Saxifraga eschscholtzii* Sternb.  
*Saxifraga flagellaris* Willd.  
*Saxifraga foliolosa* R. Br.  
*Saxifraga hirculus* L.  
*Saxifraga lyallii* Engler ssp. *hultenii* (Cald. & Sav.) Cald. & Sav.  
*Saxifraga nelsoniana* D. Don [= *S. punctata* L. ssp. *pacifica* Hult.]  
*Saxifraga nivalis* L.  
*Saxifraga oppositifolia* L.  
*Saxifraga rivularis* L.  
*Saxifraga serpyllifolia* Pursh  
*Saxifraga tricuspidata* Rottb.  
*Scheuchzeria palustris* L.  
*Schizachne purpurascens* (Torr.) Swallen  
*Scirpus paludosus* Nels.  
*Scirpus validus* M. Vahl  
*Scutellaria galericulata* L.  
*Selaginella selaginoides* (L.) Link  
*Senecio lugens* Richards  
*Senecio pauciflorus* Pursh  
*Senecio triangularis* Hook.  
*Senecio vulgaris* L.  
*Shepherdia canadensis* (L.) Nutt.  
*Sibbaldia procumbens* L.  
*Silene acaulis* L.  
*Smilacina stellata* (L.) Desf.  
*Solidago lepida* DC.



*Solidago multiradiata* Ait.  
*Sorbus scopulina* Greene  
*Sparganium angustifolium* Michx.  
*Sparganium hyperboreum* Laest.  
*Sparganium minimum* (Hartm.) E. Fries  
*Spergula arvense* L.  
*Spergularia canadensis* (Pers.) G. Don  
*Spiraea beauverdiana* Schneid.  
*Spiranthes romanzoffiana* Cham.  
*Stellaria borealis* Bigelow  
*Stellaria borealis* Bigelow ssp. *sitchana* Steud.  
*Stellaria calycantha* (Ledeb.) Bong.  
*Stellaria crassifolia* Ehrh.  
*Stellaria humifusa* Rottb.  
*Stellaria laeta* Richards.  
*Stellaria longifolia* Muhl. ex Willd.  
*Stellaria media* (L.) Villars  
*Stellaria monantha* Hult.  
*Stellaria umbellata* Turcz.  
*Streptopus amplexifolius* (L.) DC.  
*Swertia perennis* L.  
*Swida stolonifera* (Michx.) Rydb. [= *Cornus stolonifera* Michx.]  
*Taraxacum alaskanum* Rydb.  
*Taraxacum carneocoloratum* Nels.  
*Taraxacum officinale* Weber  
*Thalictrum alpinum* L.  
*Thalictrum sparsiflorum* Trucz.  
*Thelypteris phegopteris* (L.) Solsson  
*Thlaspi arcticum* Pors.  
*Tofieldia coccinea* Richards.  
*Tofieldia glutinosa* (Michx.) Pers.  
*Tofieldia pusilla* (Michx.) Pers.  
*Trichophorum alpinum* (L.) Pers.  
*Trichophorum cespitosum* (L.) Hartm.  
*Trientalis europaea* L.  
*Trifolium hybridum* L.  
*Trifolium pratense* L.  
*Trifolium repens* L.  
*Triglochin maritimum* L.  
*Triglochin palustre* L.  
*Tripleurospermum inodorum* (L.) Schultz-Bip.  
*Trisetum spicatum* (L.) Richter  
*Trisetum spicatum* (L.) Richter ssp. *alaskanum* (Nash) Hult.  
*Trisetum spicatum* (L.) Richter ssp. *molle* (Michaux) Hult.  
*Triticum aestivum* L.

*Tsuga mertensiana* (Bong.) Sarg.  
*Typha latifolia* L.  
*Urtica dioica* L. ssp. *gracilis* (Aiton) Selander  
*Utricularia intermedia* Hayne  
*Utricularia minor* L.  
*Utricularia vulgaris* L. ssp. *macrorhiza* (LeConte) Clauson  
*Vaccinium cespitosum* Michx.  
*Vaccinium ovalifolium* Sm.  
*Vaccinium uliginosum* L.  
*Vaccinium vitis-idaea* L.  
*Vahlodea atropurpurea* (Wahlenb.) E. Fries ssp. *paramushirensis* (Kudo) Hult.  
*Valeriana capitata* Pall.  
*Valeriana sitchensis* Bong.  
*Veratrum viride* Ait.  
*Veronica americana* Schwein.  
*Veronica wormskjoldii* Roem & Schult.  
*Viburnum edule* (Michx.) Raf.  
*Vicia cracca* L.  
*Viola epipsila* Ledeb.  
*Viola langsдорфii* Fisch.  
*Viola renifolia* Gray  
*Viola selkirkii* Pursh  
*Woodsia ilvensis* (L.) R. Br.  
*Zannichellia palustris* L.  
*Zigadenus elegans* Pursh

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FNA\* Flora North America North of Mexico (FNAEC 1993).

# **Appendix C**

## **Fort Richardson Vascular Plant Survey With Generalized Vegetation Zone and Habitat Matrix (Alphabetical Listing)**

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**\*\* Rare species currently being tracked in the Alaska Natural Heritage Program's Biological Conservation Database for southcentral Alaska.**

**RE Major range extensions using the maps of Hulten (1968)**  
**re Minor range extensions using the maps of Hulten (1968)**  
**i Introduced taxa**

**See text for Zone and Habitat definitions**

**W Wet Habitats**  
**MD Moist to Dry Habitats**  
**DISTURBED Disturbed Habitats**

**FNA\* Flora North America North of Mexico (FNAEC 1993)**

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES			
	W	MD	W	MD	W	MD						
<i>Achillea millefolium</i> L.								X	rei			
<i>Achillea ptarmica</i> L.								X	rei			
<i>Achillea sibirica</i> Ledeb.		X							RE			
<i>Acomastylis rossii</i> (R. Br.) E. Greene [= <i>Geum rossii</i> (R. Br.) Ser. ex DC.]						X						
<i>Aconitum delphinifolium</i> DC.		X		X								
<i>Aconitum delphinifolium</i> DC. ssp. <i>paradoxicum</i> (Reichb.) Maguire & Hult.						X			RE			
<i>Actaea rubra</i> (Ait.) Willd.		X		X								
<i>Adoxa moschatellina</i> L.		X										
<i>Agrostis scabra</i> Willd.		X						X				
<i>Allium schoenoprasum</i> L.	X			X								
<i>Alnus sinuata</i> (Regel) Rydb. [= <i>A. crispa</i> (Ait.) Pursh ssp. <i>sinuata</i> (Regel) Hult.]		X		X								
<i>Alnus tenuifolia</i> Nutt. [= <i>A. incana</i> (L.) Moench ssp. <i>tenuifolia</i> (Nutt.) Breitung]	X	X										
<i>Alnus viridis</i> Villar ssp. <i>crispa</i> (Ait.) Loeve & Loeve [= <i>A. crispa</i> (Ait.) Pursh ssp. <i>crispa</i> ]				X								
<i>Alopecurus aequalis</i> Sobol.	X											
<i>Alopecurus alpinus</i> Smith			X						RE			
<i>Amaranthus retroflexus</i> L.								X	rei			
<i>Amelanchier alnifolia</i> (Nutt.) Nutt.		X		X								
<i>Andromeda polifolia</i> L.	X											
<i>Anemone multifida</i> Poir. var. <i>saxicola</i> B. Boivan						X			re,**			
<i>Anemone narcissiflora</i> L. ssp. <i>villosissima</i> (DC.) Hult.		X		X		X			RE			
<i>Anemone narcissiflora</i> L. var. <i>monantha</i> DC.						X						
<i>Anemone parviflora</i> Michx.						X						
<i>Anemone richardsonii</i> Hock.	X		X									
<i>Angelica genuflexa</i> Nutt.			X									
<i>Angelica lucida</i> E. Nels.		X	X	X								
<i>Antennaria alpina</i> (L.) Gaertn.							X					
<i>Antennaria friesiana</i> (Trautv.) Ekman							X					

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

APRIL 18, 1995

PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED		NOTES
	W	MD	W	MD	W	MD				
<i>Antennaria friesiana</i> (Trautv.) Ekman ssp. <i>alaskana</i> (Malte) Hult.						X				RE
<i>Antennaria monocephala</i> DC.						X				
<i>Antennaria rosea</i> E. Greene ssp. <i>pulvinata</i> (E. Greene) Bayer		X								
<i>Antennaria rosea</i> (D.C. Eaton) E. Greene		X								
<i>Anthemis cotula</i> L.										
<i>Anthemis tinctoria</i> L.								X		rei
<i>Aphragmus eschscholtzianus</i> Andrz.								X		rei
<i>Aquilegia formosa</i> Fisch.		X		X	X					re, **
<i>Arabis hirsuta</i> (L.) Scop. ssp. <i>eschscholtziana</i> (Andrz.) Hult.		X		X						
<i>Arabis holboellii</i> Hornem.		X								
<i>Arabis lyrata</i> L. ssp. <i>kamchatica</i> (Fisch.) Hult.		X		X		X				
<i>Arctagrostis latifolia</i> (R. Br.) Griseb.						X				
<i>Arctagrostis poaeoides</i> Nash	X									
<i>Arctogrostis latifolia</i> (R. Br.) Griseb. var. <i>arundinacea</i> (Trin.) Griseb.						X				
<i>Arctogrostis latifolia</i> (R. Br.) Griseb. var. <i>latifolia</i>	X									
<i>Arctostaphylos uva-ursi</i> (L.) Sprengel		X		X		X				
<i>Arctous alpina</i> (L.) Niedenzu [= <i>Arctostaphylos alpina</i> (L.) Spreng.]				X		X				
<i>Arctous rubra</i> (Rehd. & Wilson) Nakai [= <i>Arctostaphylos rubra</i> (Rehd. & Wilson) Fern.]						X				
<i>Armeria maritima</i> (Mill.) Willd. ssp. <i>arctica</i> (Cham.) Hult.										RE
<i>Arnica griseonii</i> Fern. ssp. <i>frigida</i> (C. Meyer ex Iljin) S. J. Wolf						X				
<i>Arnica latifolia</i> Bong.			X	X						
<i>Arnica lessingii</i> Greene						X				re
<i>Arnica ovata</i> E. Greene				X		X				
<i>Artemisia arctica</i> Less.				X		X				
<i>Artemisia tilesii</i> Ledeb.		X							X	
<i>Aster junciformis</i> Rydb.	X									
<i>Aster sibiricus</i> L.		X				X				

FORT RICHARDSON VASCULAR PLANT SPECIES LIST										
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	APRIL 18, 1995		NOTES
	W	MD	W	MD	W	MD		DISTURBED		
<i>Astragalus alpinus</i> L.		X				X			X	
<i>Astragalus alpinus</i> L. ssp. <i>alpinus</i>		X				X			X	
<i>Astragalus polaris</i> Benth.						X				RE
<i>Astragalus umbellatus</i> Bunge				X						re
<i>Athyrium filix-femina</i> (L.) Roth		X		X		X				
<i>Atriplex gmelini</i> C.A. Meyer							X			**
<i>Avena fatua</i> L.									X	rei
<i>Barbarea orthoceras</i> Ledeb.	X									
<i>Beckmannia erucaeformis</i> (L.) Host ssp. <i>baicalensis</i> (Kusn.) Hult.		X							X	
<i>Betula glandulosa</i> Michx.				X						
<i>Betula hybrids</i>	X		X		X	X				
<i>Betula kenaica</i> Evans		X								
<i>Betula papyrifera</i> Marshall	X	X								
<i>Bistorta vivipara</i> (L.) Gray [= <i>Polygonum viviparum</i> L.]				X		X				
<i>Boschniakia rossica</i> (Cham & Schltdl.) B. Fedtsch.		X								
<i>Botrichium boreale</i> (E. Fries) Milde (= <i>B. pinnatum</i> H. St. John In: FNA*)				X						
<i>Botrichium lanceolatum</i> (Gmel.) Angstr.		X		X						
<i>Botrichium lunaria</i> (L.) Sw.				X						
<i>Brassica rapa</i> L.									X	
<i>Bromopsis inermis</i> (Leyss.) Holub [= <i>Bromus inermis</i> Leyss.]									X	
<i>Bromus tectorum</i> L.									X	
<i>Calamagrostis canadensis</i> (Michx.) Beauv.	X	X		X		X				
<i>Calamagrostis deschampsoides</i> Trin.								X		re
<i>Calamagrostis inexpansa</i> Gray	X	X								
<i>Calamagrostis lapponica</i> (Wahlenb.) Hartman. F.	X	X								
<i>Calamagrostis nutkaensis</i> (C. Presl) Steudel	X									
<i>Callitriche verna</i> L. emend. Lonnr.	X		X							





FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Carex loliacea</i> L.	X												
<i>Carex lyngbyaei</i> Hornem.	X						X						
<i>Carex mackenziei</i> V. Krecz.							X						
<i>Carex macloviana</i> Urv.	X	X		X		X							
<i>Carex macrochaeta</i> C.A. Mey.		X	X	X									
<i>Carex magellanica</i> Lam. ssp. <i>irrigua</i> (Wahlenb.) Hult.	X												
<i>Carex media</i> R. Br.	X	X	X	X									
<i>Carex membranacea</i> Hook.	X		X										
<i>Carex mertensii</i> Prescott		X		X									
<i>Carex microchaeta</i> Holm.					X								
<i>Carex microchaeta</i> Holm. ssp. <i>nesophila</i> (Holm.) D. Murray						X							
<i>Carex micropoda</i> C.A. Meyer [= <i>C. pyrenaica</i> Wahlenb. ssp. <i>micropoda</i> (C. A. Meyer) Hult.]					X								
<i>Carex nigricans</i> C.A. Meyer					X								
<i>Carex obtusata</i> Lilj.				X		X			RE				
<i>Carex oederi</i> Retz.	X												
<i>Carex pauciflora</i> Lightf.	X												
<i>Carex pluriflora</i> Hult.	X												
<i>Carex podocarpa</i> C.B. Clarke					X	X							
<i>Carex praticola</i> Rydb.		X		X									
<i>Carex ramenskii</i> Kom.							X						
<i>Carex rariflora</i> (Wahlenb.) Smith	X								RE				
<i>Carex rostrata</i> Stokes	X												
<i>Carex rotundata</i> Wahlenb.	X												
<i>Carex saxatilis</i> L.			X										
<i>Carex scirpoidea</i> Michx.				X		X			RE				
<i>Carex spectabilis</i> Dewey					X								

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

APRIL 18, 1995

PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES
	FOREST		ALPINE		ALPINE				
	W	MD	W	MD	W	MD			
<i>Carex tenuiflora</i> Wahlenb.	X		X						
<i>Carex utriculata</i> F. Boott	X								
<i>Carex vaginata</i> Tausch			X	X					RE
<i>Cassiope lycopodioides</i> (Pall.) D. Don						X			
<i>Cassiope stelleriana</i> (Pall.) DC.				X		X			
<i>Cassiope tetragona</i> (L.) D. Don				X		X			
<i>Castilleja unalaschcensis</i> (Cham. & Schlecht.) Malte			X	X				X	
<i>Cerastium arvense</i> L.				X					
<i>Cerastium beeringianum</i> Cham. & Schlecht. var. <i>beeringianum</i>						X			
<i>Cerastium fontanum</i> Baumg.								X	
<i>Chamaedaphne calyculata</i> (L.) Moench	X								
<i>Chenopodium album</i> L.								X	
<i>Chrysanthemum arcticum</i> L.							X		
<i>Chrysanthemum leucanthemum</i> L.									
<i>Chrysosplenium tetrandrum</i> (Lund) T. Fries	X		X						
<i>Cicuta douglasii</i> (DC.) J. Coulter & Rose			X						
<i>Cicuta virosa</i> L. [=C. <i>mackenzieana</i> Raup]	X								
<i>Circaea alpina</i> L.	X								
<i>Claytonia sarmentosa</i> C. Meyer						X			
<i>Coeloglossum viride</i> (L.) Hartm. ssp. <i>bracteatum</i> (Muhl.) Hult.				X					
<i>Comarum palustre</i> L. [= <i>Potentilla palustris</i> (L.) Scop.]	X								
<i>Conioselinum pacificum</i> (S. Wats.) Coult. & Rose [=C. <i>chinense</i> (L.) BSP.]	X	X		X			X		
<i>Coralorrhiza trifida</i> Chatel.		X							
<i>Cornus canadensis</i> L.		X							
<i>Cornus suecica</i> L.						X			
<i>Corydalis pauciflora</i> (Steph.) Pers.									
<i>Corydalis sempervirens</i> (L.) Pers.		X			X				X

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST	SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES					
		W	MD	W	MD								
<i>Crepis elegans</i> Hook.						X							
<i>Crepis nana</i> Richards.						X		re					
<i>Crepis tectorum</i> L.							X	rei					
<i>Cryptogramma acrostichoides</i> R. Br. [= <i>C. crispa</i> (L.) R. Br. var. <i>acrostichoides</i> (R. Br.) Clarke]						X							
<i>Cystopteris fragilis</i> (L.) Bernh.		X		X		X							
<i>Cystopteris montana</i> (Lam.) Bernh.		X	X	X									
<i>Dactylis glomerata</i> L.							X	rei					
<i>Delphinium glaucum</i> S. Wats.		X		X									
<i>Deschampsia caespitosa</i> (L.) P. Beauv. ssp. <i>caespitosa</i>	X												
<i>Descurainia sophioides</i> (Fisch.) O.E. Shultz							X						
<i>Diapensia lapponica</i> L.						X							
<i>Dodecatheon pulchellum</i> (Raf.) Merr.							X						
<i>Douglasia alaskana</i> (Cov. & Stand. ex Hult.) S. Kelso [= <i>Androsace alaskana</i> Cov. & Stand.]						X		**					
<i>Draba alpina</i> L.						X							
<i>Draba aurea</i> Vahl				X		X							
<i>Draba borealis</i> DC.				X			X						
<i>Draba cana</i> Rydb. [= <i>D. lanceolata</i> Royle In: Hulten 1968]				X				RE?					
<i>Draba crassifolia</i> Graham						X		RE					
<i>Draba fladzinensis</i> Wulf.						X							
<i>Draba glabella</i> Pursh						X							
<i>Draba lactea</i> Adams						X							
<i>Draba lonchocarpa</i> Rydb.				X		X		RE					
<i>Draba longipes</i> Raup						X							
<i>Draba nivalis</i> Liljeb.						X							
<i>Draba ruaxes</i> Payson & H. St. John						X		RE, **					
<i>Draba stenoloba</i> Ledeb.						X							

FORT RICHARDSON VASCULAR PLANT SPECIES LIST												APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES					
	W	MD	W	MD	W	MD								
<i>Draba stenopetala</i> Trautv.						X			RE, **					
<i>Drocera anglica</i> Huds.		X												
<i>Drocera rotundifolia</i> L.		X		X										
<i>Dryas alaskensis</i> Pors. [= <i>D. octopetala</i> L. ssp. <i>alaskensis</i> (Pors.) Hult.]						X								
<i>Dryas drummondii</i> Richards.		X												
<i>Dryas integrifolia</i> Vahl.						X?								
<i>Dryas octopetala</i> L.						X								
<i>Dryopteris dilatata</i> (Hoffm.) A.Gray		X		X		X								
<i>Dryopteris fragrans</i> (L.) Schott		X												
<i>Eleocharis kamtschatica</i> (C.A. Meyer) V. Komarov							X							
<i>Eleocharis palustris</i> (L.) Roem. & Schult.	X													
<i>Eleocharis quinquefolia</i> (F. Hartmann) O. Schwarz	X								RE, **					
<i>Elymus alaskanus</i> (Scribn. & Merr.) A. Loeve ssp. <i>alaskanus</i> [= <i>Agropyron violaceum</i> (Hornem.) Lange]		X		X		X								
<i>Elymus glaucus</i> Buckley		X							RE					
<i>Elymus sibiricus</i> L.		X						X						
<i>Elymus trachycaulis</i> (Link) Gould ex Shinners ssp. <i>andinus</i> (Scribner & Smith) A.								X						
<i>Elymus trachycaulis</i> (Link) Gould ex Shinners ssp. <i>novae-angliae</i> (Scribn.) Tzvelev [= <i>Agropyron pauciflorum</i> (Schwein.) Hitchc. ssp. <i>novae-angliae</i> (Scribn.) Meldris]		X		X				X						
<i>Elytrigia repens</i> (L.) Nevski [= <i>Agropyron repens</i> (L.) Beauv.]								X						
<i>Empetrum hermaphroditum</i> (Lange) Hagerup [= <i>E. nigrum</i> L. ssp. <i>hermaphroditum</i> (Lange) Boecher]		X		X										
<i>Empetrum nigrum</i> L.		X		X										
<i>Epilobium anagallidifolium</i> Lam.				X	X	X								
<i>Epilobium angustifolium</i> L.		X												

FORT RICHARDSON VASCULAR PLANT SPECIES LIST													APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST			SUB ALPINE			ALPINE			HALO-PHYTIC	DISTURBED	NOTES			
	FOREST		SUB ALPINE	ALPINE		ALPINE									
	W	MD		W	MD	W	MD								
<i>Epilobium ciliatum</i> Raf. ssp. <i>glandulosum</i> (Lehm.) Hoch & Raven [ <i>E. glandulosum</i> Lehm.)				X			X								
<i>Epilobium hornemannii</i> Reichenb. ssp. <i>hornemannii</i>				X											
<i>Epilobium latifolium</i> L.		X			X			X			X				
<i>Epilobium palustre</i> L.	X														
<i>Equisetum arvense</i> L.	X	X		X	X			X	X		X				
<i>Equisetum fluviatile</i> L. ampl. Ehrh.	X			X											
<i>Equisetum palustre</i> L.				X											
<i>Equisetum pratense</i> L.		X													
<i>Equisetum scirpoides</i> Michx.					X			X							
<i>Equisetum silvaticum</i> L.		X													
<i>Equisetum variegatum</i> Schlecht.		X													
<i>Erigeron acris</i> L.		X									X				
<i>Erigeron humilis</i> Graham									X						
<i>Erigeron peregrinus</i> (Pursh) Greene				X	X			X	X						
<i>Erigeron purpuratus</i> Greene									X			re			
<i>Eriophorum angustifolium</i> Honck. ssp. <i>subarcticum</i> (V. Vassiljev) Hult.	X			X				X							
<i>Eriophorum gracile</i> Koch	X														
<i>Eriophorum russeolum</i> Fries	X			X				X							
<i>Eriophorum russeolum</i> Fries var. <i>albidum</i> W. Nyl.	X			X				X	X						
<i>Eriophorum scheuchzeri</i> Hoppe	X														
<i>Eriophorum viridi-carinatum</i> (Engelm.) Fern.	X														
<i>Erucastrum gallicum</i> (Willd.) O. E. Schulz [= <i>Brassica erucastrum</i> ]		X									X				
<i>Erysimum cheiranthoides</i> L.		X									X				
<i>Erysimum cheiranthoides</i> L. ssp. <i>altum</i> Ahti		X													
<i>Euphrasia disjuncta</i> Fern & Wieg.		X									X				
<i>Eutrema edwardsii</i> R. Br.					X	X		X	X			RE			

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
	<i>Festuca altaica</i> Trin.				X		X						
<i>Festuca brevissima</i> Yurtsev						X							
<i>Festuca rubra</i> L.		X					X						
<i>Festuca vivipara</i> (L.) Smith													
<i>Fragaria chiloensis</i> (L.) Duchesne						X			RE				
<i>Fritillaria camschatcensis</i> (L.) Ker-Gawl.		X		X				X					
<i>Galeopsis bifida</i> Boem.								X					
<i>Galium boreale</i> L.		X		X				X					
<i>Galium trifidum</i> L. ssp. <i>trifidum</i>	X												
<i>Galium triflorum</i> Michx.	X												
<i>Gastrolychnis apetala</i> (L.) Tolm & Koz. [= <i>Melandrium apetalum</i> (L.) Fenzl.]						X							
<i>Gentiana glauca</i> Pallas						X							
<i>Gentianella amarella</i> (L.) Boerner [= <i>Gentiana amarella</i> L. ssp. <i>acuta</i> (Michx.) Hult.]				X									
<i>Gentianella propinqua</i> (Richards.) Gillet var. <i>propinqua</i> [= <i>Gentiana propinqua</i> Richards. ssp. <i>propinqu</i> ]				X									
<i>Geocaulon lividum</i> (Richards.) Fern.		X		X									
<i>Geranium erianthum</i> DC.		X		X									
<i>Geranium pusillum</i> Burm.								X					
<i>Geum macrophyllum</i> Willd. ssp. <i>macrophyllum</i>		X											
<i>Geum perincisum</i> Rydb. [= <i>G. macrophyllum</i> Willd. ssp. <i>perincisum</i> (Rydb.) Raup.]		X							RE				
<i>Glaux maritima</i> L.							X						
<i>Glyceria borealis</i> (Nash) Batch.	X												
<i>Glyceria striata</i> (Lam.) A. Hitchc. ssp. <i>stricta</i> (Scribn.) Hult.	X												
<i>Goodyera repens</i> (L.) R. Br. var. <i>ophioides</i> Fern.		X											
<i>Gymnocarpium dryopteris</i> (L.) Newm.		X		X									
<i>Hammarbya paludosa</i> (L.) Ktze.	X												
<i>Hedysarum alpinum</i> L.		X						X					

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES			
	W	MD	W	MD	W	MD						
<i>Helianthus annuus</i> L.								X	rei			
<i>Heracleum lanatum</i> Michx.		X		X				X				
<i>Heuchera glabra</i> Willd.	X	X	X	X								
<i>Hieracium triste</i> Willd.						X			re			
<i>Hierchloe alpina</i> (Sw.) Roem. & Schult.				X		X						
<i>Hierchloe odorata</i> (L.) P. Beauv.		X		X								
<i>Hippuris montana</i> Ledeb.	X		X		X							
<i>Hippuris tetraphylla</i> L.F.							X					
<i>Hippuris vulgaris</i> L.	X											
<i>Hordeum brachyantherum</i> Nevski		X										
<i>Hordeum jubatum</i> L.		X						X				
<i>Hyperzia selago</i> (L.) C. Martius [= <i>H. haleakalae</i> (Brackenridge) Holub In: FNA*]				X		X						
<i>Hyperzia selago</i> (L.) C. Martius ssp. <i>chinense</i> (C. Chr.) Loeve & Loeve [= <i>Lycopodium selago</i> (L.) ssp. <i>chinense</i> (C. Chr.) Hult.; = <i>H. myoshitana</i> (Makino) Ching In: FNA*]		X										
<i>Impatiens noli-tangere</i> L.	X											
<i>Iris setosa</i> Pall. ssp. <i>setosa</i>	X		X									
<i>Isoetes echinospora</i> Durieu	X											
<i>Juncus alpinus</i> Villers	X											
<i>Juncus biglumis</i> L.						X						
<i>Juncus bufonius</i> L.	X											
<i>Juncus castaneus</i> Smith		X				X						
<i>Juncus castaneus</i> Sm. ssp. <i>castaneus</i>	X											
<i>Juncus castaneus</i> Sm. ssp. <i>leucochlamys</i> (Zinz.) Hult.	X											
<i>Juncus drummondii</i> E. Mey.					X							
<i>Juncus ensifolius</i> Wikstrom	X											
<i>Juncus mertensianus</i> Bong.	X											
<i>Juncus stygius</i> L. ssp. <i>americanus</i> (Buchenau) Hult.	X											

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Juncus triglumis</i> L.	X												
<i>Juniperus communis</i> L.		X		X		X							
<i>Lathyrus palustris</i> L. ssp. <i>pilosus</i> (Cham.) Hult.		X					X						
<i>Ledum groenlandicum</i> Oeder [= <i>L. palustre</i> L. ssp. <i>groenlandicum</i> (Oeder) Hult.]	X	X											
<i>Ledum palustre</i> L. ssp. <i>decumbens</i> (Ait.) Hult.				X		X							
<i>Lemna minor</i> L.	X												
<i>Lepidium densiflorum</i> Schrad.								X					
<i>Leptarrhena pyrolifolia</i> (D. Don) Ser.			X		X								
<i>Leymus mollis</i> (Trin.) Hara ssp. <i>mollis</i> [= <i>Elymus arenarius</i> L. ssp. <i>mollis</i> (Trin.) Hult.]		X					X	X					
<i>Ligusticum scoticum</i> L. ssp. <i>hultenii</i> (Fern.) Cald. & Tayl.							X						
<i>Linaria vulgaris</i> Mill.								X					
<i>Linnaea borealis</i> L.		X		X		X							
<i>Listera cordata</i> (L.) R. Br.		X		X		X							
<i>Lloydia serotina</i> (L.) Rehb.						X							
<i>Loiseleuria procumbens</i> (L.) Desv.				X		X							
<i>Lolium multiflorum</i> Lam.								X	rei				
<i>Luetkea pectinata</i> (Pursh) Ktze.				X	X	X							
<i>Lupinus nootkatensis</i> Donn		X		X									
<i>Lupinus polyphyllus</i> Lindl.		X		X									
<i>Luzula arcuata</i> (Wahlenb.) Sw.						X							
<i>Luzula arcuata</i> (Wahlenb.) Sw. ssp. <i>unalaschensis</i> (Buchenau) Hult.						X							
<i>Luzula confusa</i> Lindeb.						X							
<i>Luzula multiflora</i> (Retz.) Lej. var. <i>frigida</i> (Buchenau) Hult.	X												
<i>Luzula parviflora</i> (Ehrh.) Desv.				X		X							
<i>Luzula spicata</i> (L.) DC.						X							
<i>Luzula wahlenbergii</i> Rupr.													
<i>Lycopodium alpinum</i> L. [= <i>Diphasiastrum alpinum</i> (L.) Holub In: FNA*]				X		X							



FORT RICHARDSON VASCULAR PLANT SPECIES LIST										APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES		
	W	MD	W	MD	W	MD					
<i>Lycopodium annotinum</i> L.		X									
<i>Lycopodium clavatum</i> L. ssp. <i>monostachyon</i> (Grev. & Hook.) Sel. [= <i>L. lagopus</i> (Laest. ex C. Hartman) In: FNA*]		X		X		X					
<i>Lycopodium complanatum</i> L. [= <i>Diphasiastrum complanatum</i> (L.) Holub In: FNA*]		X		X							
<i>Lycopodium sabinaefolium</i> Willd. var. <i>sitchense</i> (Rupt.) Fern. [= <i>Diphasiastrum sitchense</i> (Ruptrecht) Holub In: FNA*]				X							
<i>Lysimachia thyrsiflora</i> L.	X						X?				
<i>Malaxis monophylla</i> (L.) Sw. var. <i>brachypoda</i> (A. Gray) Morris & Ames	X										
<i>Matricaria matricarioides</i> (Less.) Porter								X			
<i>Matteuccia struthiopteris</i> (L.) Tod.		X									
<i>Medicago falcata</i> L.								X	rei		
<i>Medicago sativa</i> L.								X	rei		
<i>Melandrium noctiflorum</i> (L.) Fries								X	rei		
<i>Melilotus albus</i> Desr.								X			
<i>Melilotus officinalis</i> (L.) Lam.								X			
<i>Mentha arvensis</i> L.	X										
<i>Menyanthes trifoliata</i> L.	X		X								
<i>Menziesia ferruginea</i> Sm.		X									
<i>Mertensia paniculata</i> (Ait.) G. Don		X		X							
<i>Mimulus guttatus</i> DC.	X										
<i>Minuartia biflora</i> (L.) Sching & Thell.						X			re		
<i>Minuartia macrocarpa</i> (Pursh) Ostenf.						X					
<i>Minuartia rubella</i> (Wahlenb.) Graebn.						X					
<i>Mitella pentandra</i> Hook.			X	X							
<i>Moehringia lateriflora</i> (L.) Fenzl		X		X							
<i>Moneses uniflora</i> (L.) Gray		X									
<i>Myosotis alpestris</i> F. W. Schmidt						X					

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

APRIL 18, 1995

PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED		NOTES
	W	MD	W	MD	W	MD				
<i>Myrica gale</i> L.	X									
<i>Myriophyllum exalbens</i> Fern. [= <i>M. spicatum</i> L.]	X									RE
<i>Myriophyllum verticillatum</i> L.	X									RE
<i>Najas flexilis</i> (Willd.) Rost. & Schmidt	X									RE
<i>Nuphar polysepalum</i> Engelm.	X									
<i>Oplopanax horridus</i> (Smith) Miquel [= <i>Echinopanax horridum</i> (Sm.) Decne. & Planch.]		X								
<i>Orthilia secunda</i> (L.) House [= <i>Pyrola secunda</i> L. ssp. <i>secunda</i> ]		X		X		X				
<i>Osmorhiza depauperata</i> Phill.		X								RE
<i>Oxycoccus microcarpus</i> Turcz. ex Rupr.	X		X							
<i>Oxyria digyna</i> (L.) Hill				X	X	X				
<i>Oxytropis bryophila</i> (E. Greene) Yurtsev						X				
<i>Oxytropis huddelsonii</i> Pors.						X				RE, **
<i>Oxytropis maydelliana</i> Trautv.						X				
<i>Oxytropis varians</i> (Rydb.) Schumann						X				
<i>Papaver alboroseum</i> Hult.						X				**
<i>Papaver nudicaule</i> L.								X		
<i>Papaver radiculatum</i> Rottb. ssp. <i>radiculatum</i>						X				
<i>Parnassia kotzebuei</i> Cham. & Schlecht.	X		X	X						
<i>Parnassia palustris</i> L.	X		X							
<i>Parnassia palustris</i> L. ssp. <i>neogaea</i> (Fern.) Hult.	X		X							
<i>Pedicularis capitata</i> Adams.				X		X				
<i>Pedicularis labradorica</i> Wirsing			X	X		X				
<i>Pedicularis lanata</i> Cham. & Schlecht	X					X				
<i>Pedicularis langsdoerfi</i> Fisch. ex Steven			X	X		X				RE
<i>Pedicularis verticillata</i> L.				X		X				
<i>Pentaphylloides floribunda</i> (Pursh.) Loeve [= <i>Potentilla fruticosa</i> L.]	X	X		X						
<i>Petasites frigidus</i> (L.) Franchet	X		X							RE

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Petasites sagittatus</i> (Banks) Gray	X												
<i>Phalaris arundinacea</i> L.	X												
<i>Phleum commutatum</i> Gaudin var. <i>americanum</i> (Fourn.) Hult.				X		X							
<i>Phleum pratense</i> L.								X					
<i>Phyllodoce aleutica</i> (Spreng.) A. A. Heller						X							
<i>Picea glauca</i> (Moench) Voss		X		X									
<i>Picea mariana</i> (Mill.) Britt., Sterns & Pogg	X	X	X										
<i>Pinguicula villosa</i> L.			X										
<i>Plantago major</i> L. var. <i>major</i>								X					
<i>Plantago maritima</i> L. ssp. <i>juncoides</i> (Lam.) Hult.							X						
<i>Platanthera dilatata</i> Pursh	X		X						re				
<i>Platanthera hyperborea</i> (L.) Lindl. var. <i>hyperborea</i>	X		X	X									
<i>Platanthera hyperborea</i> (L.) Lindl. var. <i>viridiflora</i> (Cham.) Luer	X												
<i>Platanthera obtusata</i> (Pursh) Lindl.			X										
<i>Poa alpigena</i> (E. Fries) Lindm.		X											
<i>Poa alpina</i> L.						X							
<i>Poa annua</i> L.	X												
<i>Poa arctica</i> R. Br.				X									
<i>Poa eminens</i> Presl		X											
<i>Poa glauca</i> M. Vahl.		X		X		X		X					
<i>Poa palustris</i> L.	X												
<i>Poa paucispicula</i> Scribn. & Merr.						X							
<i>Poa pratensis</i> L.								X					
<i>Poa psuedoabbreviata</i> Rosch.									re				
<i>Polemonium acutiflorum</i> Willd.													
<i>Polemonium pulcherrimum</i> Hook.	X	X	X					X					
<i>Polygonum amphibium</i> L.	X	X											

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Polygonum aviculare</i> L.								X					
<i>Polygonum convolvulus</i> L.								X					
<i>Polygonum fowleri</i> Robins.							X		RE				
<i>Polygonum lapathifolium</i> L.	X								rei				
<i>Polygonum pennsylvanicum</i> L. ssp. <i>oneillii</i> (Brenckle) Hult.	X												
<i>Populus balsamifera</i> L.		X		X									
<i>Populus balsamifera</i> L. ssp. <i>balsamifera</i>		X		X									
<i>Populus balsamifera</i> L. ssp. <i>trichocarpa</i> (Torr. & Gray) Brayshaw		X											
<i>Populus tremuloides</i> Michx.		X		X									
<i>Potamogeton alpinus</i> Balb.	X												
<i>Potamogeton epihydrys</i> Raf.	X												
<i>Potamogeton filiformis</i> Pers.	X												
<i>Potamogeton gramineus</i> L.	X												
<i>Potamogeton natans</i> L.	X												
<i>Potamogeton pectinatus</i> L.	X						X?						
<i>Potamogeton praelongus</i> Wulf.	X												
<i>Potamogeton richardsonii</i> (A. Bennett) Rydb. [= <i>P. perfoliatus</i> L. ssp. <i>richardsonii</i> (A. Bennett) Hult.]	X												
<i>Potamogeton vaginatus</i> Turcz.	X												
<i>Potamogeton zosterifolius</i> Schum.	X												
<i>Potentilla anserina</i> L.								X					
<i>Potentilla diversifolia</i> Lehm.						X							
<i>Potentilla egedii</i> Wormsk. ssp. <i>grandis</i> (Torr. & Gray) Hult.							X						
<i>Potentilla hyparctica</i> Malte						X			re				
<i>Potentilla multifida</i> L.		X		X		X		X					
<i>Potentilla norvegica</i> L.								X					
<i>Potentilla uniflora</i> Ledeb.						X							

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES			
	W	MD	W	MD	W	MD						
<i>Primula cuneifolia</i> Ledeb. ssp. <i>saxifragifolia</i> (Lehm.) Smith & Forrest					X?	X						
<i>Puccinellia grandis</i> Swallen							X					
<i>Puccinellia nutkaensis</i> (Presl) Fern. & Weath.							X		RE			
<i>Puccinellia phryganodes</i> (Trin.) Scribner & Marr.							X		RE			
<i>Pyrola asarifolia</i> Michx.		X		X								
<i>Pyrola asarifolia</i> Michx. var. <i>purpurea</i> (Bunge) Fern.		X		X								
<i>Pyrola chlorantha</i> Sw.		X										
<i>Pyrola minor</i> L.		X		X		X						
<i>Ranunculus arborvitus</i> L.								X				
<i>Ranunculus cymbalaria</i> Pursh							X					
<i>Ranunculus eschscholtzii</i> Schlecht.					X	X						
<i>Ranunculus gmelini</i> DC. ssp. <i>gmelini</i>	X											
<i>Ranunculus hyperboreus</i> Rottb.	X?		X		X							
<i>Ranunculus lapponicus</i> L.	X											
<i>Ranunculus macounii</i> Britt.	X											
<i>Ranunculus nivalis</i> L.						X						
<i>Ranunculus occidentalis</i> Nutt.			X	X								
<i>Ranunculus pygmaeus</i> Wahl.						X						
<i>Ranunculus scleratus</i> L. ssp. <i>multifidus</i> (Nutt.) Hult.	X											
<i>Ranunculus trichophyllus</i> Chaix	X											
<i>Ranunculus trichophyllus</i> Chaix var. <i>trichophyllus</i>	X											
<i>Rhinanthus minor</i> L.	X	X	X	X				X				
<i>Rhodiola integrifolia</i> Raf. [= <i>Sedum rosea</i> (L.) Scop. ssp. <i>integrifolia</i> (Raf.) Hult.]						X						
<i>Ribes hudsonianum</i> Richards.		X										
<i>Ribes laxiflorum</i> Pursh		X										
<i>Ribes triste</i> Pall.		X										
<i>Romanzoffia sitchensis</i> Bong.					X	X						

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST			SUB ALPINE			ALPINE			HALO-PHYTIC	DISTURBED	NOTES	
	FOREST			ALPINE			ALPINE						
	W	MD		W	MD		W	MD					
<i>Rorippa barbareaefolia</i> (DC.) Kitigawa			X								X		
<i>Rorippa palustris</i> (L.) Besser ssp. <i>hispida</i> (Desv.) Jonsell	X												
<i>Rorippa palustris</i> (L.) Besser ssp. <i>palustris</i>	X												
<i>Rorippa sylvestris</i> (L.) Besser											X		
<i>Rosa acicularis</i> Lindl.			X		X								
<i>Rosa nulkana</i> Presl			X										
<i>Rubus arcticus</i> L.				X	X		X						
<i>Rubus chamaemorus</i> L.	X			X	X								
<i>Rubus idaeus</i> L.			X			X							
<i>Rubus pedatus</i> Sm.					X	X							
<i>Rubus stellatus</i> Sm. [= <i>R. arcticus</i> L. ssp. <i>stellatus</i> (Sm.) Boiv. emend. Hult.]						X							
<i>Rumex acetosella</i> L.											X		
<i>Rumex arcticus</i> Trautv.					X								
<i>Rumex crispus</i> L.											X		
<i>Rumex fenestratus</i> Greene													
<i>Rumex transitorius</i> K. H. Resch	X											RE	
<i>Ruppia spiralis</i> L.	X									X		RE	
<i>Sagina nivalis</i> (Lindblom) Fries								X					
<i>Sagina saginoides</i> (L.) Karst.		X			X								
<i>Salicornia europaea</i> L.										X		**	
<i>Salix alaxensis</i> (Anderss.) Cov.		X			X								
<i>Salix arctica</i> Pall.									X				
<i>Salix barclayi</i> Anderss.			X?	X									
<i>Salix bebbiana</i> Sarg. [= <i>S. depressa</i> L. ssp. <i>rostrata</i> (Anderss.) Hiitonen] <i>niphoclada</i> ]		X											
<i>Salix brachycarpa</i> Nutt. ssp. <i>niphoclada</i> (Rydb.) Argus					X	X	X	X	X				
<i>Salix fuscescens</i> Anderss.	X												
<i>Salix glauca</i> L.						X		X					

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST			SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES			
	FOREST		ALPINE		ALPINE								
	W	MD	W	MD	W	MD							
<i>Salix lucida</i> Muhl. ssp. <i>lasiandra</i> (Benth.) Argus [= <i>S. lasiandra</i> Benth.]	X												
<i>Salix ovalifolia</i> Trautv.								X					
<i>Salix planifolia</i> Pursh ssp. <i>pulchra</i> (Cham.) Argus [= <i>S. pulchra</i> Cham.]				X			X						
<i>Salix reticulata</i> L.				X			X						
<i>Salix rotundifolia</i> Trautv.							X						
<i>Salix scouleriana</i> Barratt		X											
<i>Salix sitchensis</i> Sanson	X		X?										
<i>Sambucus racemosa</i> L.		X											
<i>Sanguisorba stipulata</i> Raf.	X	X	X	X	X								
<i>Saxifraga adscendens</i> L.							X						
<i>Saxifraga bronchialis</i> L.							X						
<i>Saxifraga caespitosa</i> L.							X						
<i>Saxifraga calycina</i> Sternb.							X			re			
<i>Saxifraga cernua</i> L.							X			re			
<i>Saxifraga eschscholtzii</i> Sternb.							X			RE			
<i>Saxifraga flagellaris</i> Willd.							X			re			
<i>Saxifraga foliolosa</i> R. Br.							X?	X		RE			
<i>Saxifraga hirculus</i> L.							X			re			
<i>Saxifraga lyallii</i> Engler ssp. <i>hultenii</i> (Cald. & Sav.) Cald. & Sav.				X			X						
<i>Saxifraga nelsoniana</i> D. Don [= <i>S. punctata</i> L. ssp. <i>pacifica</i> Hult.]							X	X					
<i>Saxifraga nivalis</i> L.								X					
<i>Saxifraga oppositifolia</i> L.								X					
<i>Saxifraga rivularis</i> L.							X						
<i>Saxifraga serpyllifolia</i> Pursh								X		re			
<i>Saxifraga tricuspidata</i> Rottb.								X					
<i>Scheuchzeria palustris</i> L.	X												
<i>Schizachne purpurascens</i> (Torr.) Swallen					X								

FORT RICHARDSON VASCULAR PLANT SPECIES LIST												APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST			SUB ALPINE			ALPINE			HALO-PHYTIC	DISTURBED	NOTES		
	W		MD	W		MD	W		MD					
<i>Scirpus paludosus</i> Nels.		X												
<i>Scirpus validus</i> M. Vahl		X												
<i>Scutellaria galericulata</i> L.		X												
<i>Selaginella selaginoides</i> (L.) Link		X		X										
<i>Senecio lugens</i> Richardson				X										
<i>Senecio pauciflorus</i> Pursh			X											
<i>Senecio triangularis</i> Hook.					X									
<i>Senecio vulgaris</i> L.											X			
<i>Shepherdia canadensis</i> (L.) Nutt.			X		X									
<i>Sibbaldia procumbens</i> L.					X			X						
<i>Silene acaulis</i> L.									X					
<i>Smilacina stellata</i> (L.) Desf.					X									
<i>Solidago lepida</i> DC.			X								X			
<i>Solidago multiradiata</i> Ait.					X			X						
<i>Sorbus scopulina</i> Greene			X		X									
<i>Sparganium angustifolium</i> Michx.		X												
<i>Sparganium hyperboreum</i> Laest.		X												
<i>Sparganium minimum</i> (Hartm.) E. Fries		X												
<i>Spergula arvensis</i> L.											X	rei		
<i>Spergularia canadensis</i> (Pers.) G. Don									X			RE		
<i>Spiraea beauverdiana</i> Schneid.		X			X									
<i>Spiranthes romanzoffiana</i> Cham.		X												
<i>Stellaria borealis</i> Bigelow		X	X	X	X							re		
<i>Stellaria borealis</i> Bigelow ssp. <i>sitchana</i> Steud.		X	X	X	X							RE		
<i>Stellaria calycantha</i> (Ledeb.) Bong.		X	X	X	X									
<i>Stellaria crassifolia</i> Ehrh.			X									RE		
<i>Stellaria humifusa</i> Rottb.									X			re		



**FORT RICHARDSON VASCULAR PLANT SPECIES LIST**

**APRIL 18, 1995**

PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES
	W	MD	W	MD	W	MD			
<i>Stellaria laeta</i> Richards.						X			
<i>Stellaria longifolia</i> Muhl. ex Willd.		X							
<i>Stellaria media</i> (L.) Villars								X	
<i>Stellaria monantha</i> Hult.				X		X			
<i>Stellaria umbellata</i> Turcz.						X			RE, **
<i>Streptopus amplexifolius</i> (L.) DC.				X					
<i>Swertia perennis</i> L.			X						
<i>Swida stolonifera</i> (Michx.) Rydb. [= <i>Cornus stolonifera</i> Michx.]		X							
<i>Taraxacum alaskanum</i> Rydb.						X			
<i>Taraxacum carneocoloratum</i> Nels.		X?				X			re, **
<i>Taraxacum officinale</i> Weber								X	
<i>Thalictrum alpinum</i> L.						X			re
<i>Thalictrum sparsiflorum</i> Trucz.		X							
<i>Thelypteris phegopteris</i> (L.) Solsson		X		X					
<i>Thlaspi arcticum</i> Pors.						X			re, **
<i>Tofieldia coccinea</i> Richards.						X			
<i>Tofieldia glutinosa</i> (Michx.) Pers.	X								
<i>Tofieldia pusilla</i> (Michx.) Pers.			X						
<i>Trichophorum alpinum</i> (L.) Pers.	X								
<i>Trichophorum caespitosum</i> (L.) Hartm.		X	X						
<i>Trientalis europaea</i> L.	X	X	X	X		X			
<i>Trifolium hybridum</i> L.								X	
<i>Trifolium pratense</i> L.								X	
<i>Trifolium repens</i> L.								X	
<i>Triglochin maritimum</i> L.							X		
<i>Triglochin palustris</i> L.			X				X		
<i>Tripleurospermum inodorum</i> (L.) Schultz-Bip.								X	rei

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

APRIL 18, 1995

PLANT NAME	LOWLAND FOREST	SUB ALPINE	ALPINE	HALO-PHYTIC	DISTURBED	NOTES
	W	MD	W	MD	W	MD
<i>Trisetum spicatum</i> (L.) Richter						X
<i>Trisetum spicatum</i> (L.) Richter ssp. <i>alaskanum</i> (Nash) Hult.				X		X
<i>Trisetum spicatum</i> (L.) Richter ssp. <i>molle</i> (Michaux) Hult.				X		X
<i>Triticum aestivum</i> L.						X
<i>Tsuga mertensiana</i> (Bong.) Sarg.				X		
<i>Typha latifolia</i> L.	X					
<i>Urtica dioica</i> L. ssp. <i>gracilis</i> (Aiton) Sclander	X					
<i>Utricularia intermedia</i> Hayne	X					
<i>Utricularia minor</i> L.	X					
<i>Utricularia vulgaris</i> L. ssp. <i>macrorhiza</i> (LeConte) Clauson	X					
<i>Vaccinium caespitosum</i> Michx.				X		X
<i>Vaccinium ovalifolium</i> Sm.				X		
<i>Vaccinium uliginosum</i> L.	X	X		X		X
<i>Vaccinium vitis-idaea</i> L.		X		X		X
<i>Vahlodea atropurpurea</i> (Wahlenb.) E. Fries ssp. <i>paramushirensis</i> (Kudo) Hult.				X		X
<i>Valeriana capitata</i> Pall.				X		
<i>Valeriana sitchensis</i> Bong.				X		
<i>Veratrum viride</i> Ait.				X		
<i>Veronica americana</i> Schwein.	X					
<i>Veronica wormskjoldii</i> Roem & Schult.				X		X
<i>Viburnum edule</i> (Michx.) Raf.		X				
<i>Vicia cracca</i> L.						X
<i>Viola epipsila</i> Ledeb.	X					
<i>Viola langsdoiffii</i> Fisch.			X	X		
<i>Viola renifolia</i> Gray		X				
<i>Viola selkirkii</i> Pursh				X		***
<i>Woodia ilvensis</i> (L.) R. Br.					X	

FORT RICHARDSON VASCULAR PLANT SPECIES LIST										APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED		NOTES	
	W	MD	W	MD	W	MD					
<i>Zannichellia palustris</i> L.							X			RE, **	
<i>Zygadenus elegans</i> Pursh		X		X							

# **Appendix D**

## **Fort Richardson Vascular Plant Survey With Generalized Vegetation Zone and Habitat Matrix (Taxonomic Listing)**

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**\*\* Rare species currently being tracked in the Alaska Natural Heritage Program's Biological Conservation Database for southcentral Alaska.**

**RE Major range extensions using the maps of Hulten (1968)**  
**re Minor range extensions using the maps of Hulten (1968)**  
**i Introduced taxa**

**See text for Zone and Habitat definitions**

**W Wet Habitats**  
**MD Moist to Dry Habitats**  
**DISTURBED Disturbed Habitats**

**FNA\* Flora North America North of Mexico (FNAEC 1993)**

FORT RICHARDSON VASCULAR PLANT SPECIES LIST												APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST	SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES					
		W	MD	W	MD								
Division LYCOPHYTA													
LYCOPODIACEAE													
<i>Huperzia selago</i> (L.) C. Martius [= <i>H. haleakalae</i> (Breckenridge) Holub In: FNA*]			X		X								
<i>Huperzia selago</i> (L.) C. Martius ssp. <i>chinense</i> (C.Chr.) Loeve & Loeve [= <i>Lycopodium selago</i> L. ssp. <i>chinense</i> (C.Chr.) Hult.; = <i>H. myoshiana</i> (Makino) Ching In: FNA*]	X												
<i>Lycopodium alpinum</i> L. [= <i>Diphasiastrum alpinum</i> (L.) Holub In: FNA*]			X		X								
<i>Lycopodium annotinum</i> L.	X												
<i>Lycopodium clavatum</i> L. ssp. <i>monostachyon</i> (Grev. & Hook.) Sel. [= <i>L. lagopus</i> (Laest. ex C. Hartman) In: FNA*]	X		X		X								
<i>Lycopodium complanatum</i> L. [= <i>Diphasiastrum complanatum</i> (L.) Holub In: FNA*]	X		X										
<i>Lycopodium sabiniaefolium</i> Willd. var. <i>sitchense</i> (Rupt.) Fern. [= <i>Diphasiastrum sitchense</i> (Ruprecht) Holub In: FNA*]			X										
SELAGINELLACEAE													
<i>Selaginella selaginoides</i> (L.) Link	X		X										
ISOETACEAE													
<i>Isoetes echinospora</i> Durieu	X												
Division SPHENOPHYTA													
EQUISETACEAE													
<i>Equisetum arvense</i> L.	X	X	X	X	X	X	X	X					
<i>Equisetum fluviatile</i> L. ampl. Ehrh.	X		X										
<i>Equisetum palustre</i> L.			X										
<i>Equisetum pratense</i> L.		X											
<i>Equisetum scirpoides</i> Michx.			X		X								
<i>Equisetum silvaticum</i> L.													
<i>Equisetum variegatum</i> Schleich.		X											
Division PTEROPHYTA													
ADIANTACEAE (includes CRYPTOGRAMMACEAE)													
<i>Cryptogramma acrostichoides</i> R. Br. [= <i>C. crispa</i> (L.) R. Br. var. <i>acrostichoides</i> (R. Br.) Clarke]							X						
ASPLENIACEAE (includes ASPIDIACEAE and ATHYRIACEAE)													
<i>Athyrium filix-femina</i> (L.) Roth		X	X	X	X	X	X	X					
<i>Cystopteris fragilis</i> (L.) Bernh.		X		X									
<i>Cystopteris montana</i> (Lam.) Bernh.		X	X	X	X	X							
<i>Dryopteris dilatata</i> (Hoffm.) A.Gray		X	X	X	X	X	X	X					
<i>Dryopteris fragrans</i> (L.) Schott	X												

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

APRIL 18, 1995

PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES
	W	MD	W	MD	W	MD			
<i>Gymnocarpium dryopteris</i> (L.) Newm.		X		X					
<i>Matteuccia struthiopteris</i> (L.) Tod.		X							
<i>Woodsia ilvensis</i> (L.) R. Br.						X			
OPHIOGLOSSACEAE									
<i>Botrichium boreale</i> (E. Fries) Milde (=B. <i>pinnatum</i> H. St. John In: FNA*)				X					
<i>Botrichium lanceolatum</i> (Gmel.) Angstr.		X		X					
<i>Botrichium lunaria</i> (L.) Sw.				X					
THELYPTERIDACEAE									
<i>Thelypteris phegopteris</i> (L.) Solsson		X		X					
DIVISION CONIFEROPHYTA									
CUPRESSACEAE									
<i>Juniperus communis</i> L.		X		X		X			
PINACEAE									
<i>Picea glauca</i> (Moench) Voss		X		X					
<i>Picea mariana</i> (Mill.) Britt., Sterns & Pogg	X	X		X					
<i>Tsuga mertensiana</i> (Bong.) Sarg.				X					
DIVISION ANTHOPHYTA: MONOCOTYLEDONAE									
CYPERACEAE									
<i>Carex aquatilis</i> Wahlenb. ssp. <i>aquatilis</i>	X								
<i>Carex atrosquama</i> Mackenzie				X					RE
<i>Carex bigelowii</i> Torr.				X		X			
<i>Carex buxbaumii</i> Wahlenb.	X								
<i>Carex canescens</i> L.	X								
<i>Carex chordorrhiza</i> Ehrh.	X								
<i>Carex circinnata</i> C. A. Mey.	X								
<i>Carex deweyana</i> Schwein.						X			
<i>Carex diandra</i> Schrank	X								re
<i>Carex dioica</i> L. ssp. <i>gynocrates</i> (Wormsk.) Hult.	X								
<i>Carex garberi</i> Fern. ssp. <i>bifaria</i> (Fern.) Hult.	X								
<i>Carex gnelinii</i> Hook. & Arn.		X							
<i>Carex kelloggii</i> W. Boott	X								
<i>Carex lachenalii</i> Schkuhr.						X			
<i>Carex lasiocarpa</i> Ehrh. ssp. <i>americana</i> (Fern.) Hult.	X								
<i>Carex leptalea</i> Wahlenb.	X			X					
<i>Carex limosa</i> L.	X								

FORT RICHARDSON VASCULAR PLANT SPECIES LIST													APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES						
	W	MD	W	MD	W	MD									
<i>Carex livida</i> (Wahlenb.) Willd.	X														
<i>Carex loliacea</i> L.	X														
<i>Carex lyngbyaei</i> Hornem.	X						X								
<i>Carex mackenziei</i> V. Krecz.							X								
<i>Carex macloviana</i> Urv.	X	X		X		X									
<i>Carex macrochaeta</i> C.A. Mey.		X	X	X											
<i>Carex magellanica</i> Lam. ssp. <i>irrigua</i> (Wahlenb.) Hult.	X														
<i>Carex media</i> R. Br.	X	X	X	X											
<i>Carex membranacea</i> Hook.	X		X												
<i>Carex mertensii</i> Prescott		X		X											
<i>Carex microchaeta</i> Holm.					X										
<i>Carex microchaeta</i> Holm. ssp. <i>nesophila</i> (Holm.) D. Murray						X									
<i>Carex micropoda</i> C.A. Meyer [= <i>C. pyrenaica</i> Wahlenb. ssp. <i>micropoda</i> (C. A. Meyer) Hult.]					X										
<i>Carex nigricans</i> C.A. Meyer				X	X				RE						
<i>Carex obtusata</i> Lilj.															
<i>Carex oederi</i> Retz.	X														
<i>Carex pauciflora</i> Lightf.	X														
<i>Carex pluriflora</i> Hult.	X														
<i>Carex podocarpa</i> C.B. Clarke					X	X									
<i>Carex praticola</i> Rydb.		X		X											
<i>Carex ramenskii</i> Kom.							X								
<i>Carex rariflora</i> (Wahlenb.) Smith	X								RE						
<i>Carex rostrata</i> Stokes	X														
<i>Carex rotundata</i> Wahlenb.	X														
<i>Carex saxatilis</i> L.			X												
<i>Carex scirpoidea</i> Michx.				X		X			RE						
<i>Carex spectabilis</i> Dewey				X											
<i>Carex tenuiflora</i> Wahlenb.	X		X												
<i>Carex utriculata</i> F. Boott	X														
<i>Carex vaginata</i> Tausch			X	X					RE						
<i>Eleocharis kamtschatica</i> (C.A. Meyer) V. Komarov							X								
<i>Eleocharis palustris</i> (L.) Roem. & Schult.	X														
<i>Eleocharis quinquefolia</i> (F. Hartmann) O. Schwarz	X								RE,**						
<i>Eriophorum angustifolium</i> Honck. ssp. <i>subarcticum</i> (V. Vassiljev) Hult.	X		X												



## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

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PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES
	W	MD	W	MD	W	MD			
<i>Eriophorum gracile</i> Koch	X								
<i>Eriophorum russeolum</i> Fries	X		X		X				
<i>Eriophorum russeolum</i> Fries var. <i>albidum</i> W. Nyl.	X		X		X				
<i>Eriophorum scheuchzeri</i> Hoppe	X								
<i>Eriophorum viridi-carinatum</i> (Englem.) Fern.	X								
<i>Scirpus paludosus</i> Nels.	X								
<i>Scirpus validus</i> M. Vahl	X								
<i>Trichophorum alpinum</i> (L.) Pers.	X								
<i>Trichophorum caespitosum</i> (L.) Hartm.	X		X						
IRIDACEAE									
<i>Iris setosa</i> Pall. ssp. <i>setosa</i>	X		X						
JUNCACEAE									
<i>Juncus alpinus</i> Villers	X								
<i>Juncus biglumis</i> L.						X			
<i>Juncus bufonius</i> L.	X								
<i>Juncus castaneus</i> Smith		X				X			
<i>Juncus castaneus</i> Sm. ssp. <i>castaneus</i>	X								
<i>Juncus castaneus</i> Sm. ssp. <i>leucochlamys</i> (Zinz.) Hult.	X								
<i>Juncus drummondii</i> E. Mey.					X				
<i>Juncus ensifolius</i> Wikstrom	X								
<i>Juncus mertensianus</i> Bong.	X								
<i>Juncus stygius</i> L. ssp. <i>americanus</i> (Buchenau) Hult.	X								
<i>Juncus triglumis</i> L.	X								
<i>Luzula arcuata</i> (Wahlenb.) Sw.						X			
<i>Luzula arcuata</i> (Wahlenb.) Sw. ssp. <i>unalaschensis</i> (Buchenau) Hult.						X			
<i>Luzula confusa</i> Lindeb.						X			
<i>Luzula multiflora</i> (Retz.) Lej. var. <i>frigida</i> (Buchenau) Hult.	X								
<i>Luzula parviflora</i> (Ehrh.) Desv.				X					
<i>Luzula spicata</i> (L.) DC.						X			
<i>Luzula wahlenbergii</i> Rupr.						X			
JUNCAGINACEAE									
<i>Triglochin maritimum</i> L.							X		
<i>Triglochin palustris</i> L.			X				X		
LEMNACEAE									
<i>Lemna minor</i> L.	X								

FORT RICHARDSON VASCULAR PLANT SPECIES LIST													APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES					
	W	MD	W	MD	W	MD								
LILIACEAE														
<i>Allium schoenoprasum</i> L.	X			X										
<i>Fritillaria camschatcensis</i> (L.) Ker-Gawl.		X		X										
<i>Lloydia serotina</i> (L.) Rchb.						X								
<i>Smilacina stellata</i> (L.) Desf.				X										
<i>Streptopus amplexifolius</i> (L.) DC.				X										
<i>Tofieldia coccinea</i> Richards.														
<i>Tofieldia glutinosa</i> (Michx.) Pers.	X													
<i>Tofieldia pusilla</i> (Michx.) Pers.			X											
<i>Veratrum viride</i> Ait.				X										
<i>Zygadenus elegans</i> Pursh		X		X										
NAJADACEAE														
<i>Najas flexilis</i> (Willd.) Rost. & Schmidt	X										RE			
ORCHIDACEAE														
<i>Coeloglossum viride</i> (L.) Hartm. ssp. bracteatum (Muhl.) Hult.				X										
<i>Corallorrhiza trifida</i> Chatel.		X												
<i>Goodyera repens</i> (L.) R. Br. var. <i>ophioides</i> Fern.		X												
<i>Hammarbya paludosa</i> (L.) Ktze.	X													
<i>Listera cordata</i> (L.) R. Br.		X		X										
<i>Malaxis monophylla</i> (L.) Sw. var. <i>brachypoda</i> (A. Gray) Morris & Ames	X										re			
<i>Platanthera dilatata</i> Pursh	X		X											
<i>Platanthera hyperborea</i> (L.) Lindl. var. <i>hyperborea</i>	X		X	X										
<i>Platanthera hyperborea</i> (L.) Lindl. var. <i>viridiflora</i> (Cham.) Luer	X													
<i>Platanthera obtusata</i> (Pursh) Lindl.			X											
<i>Spiranthes romanzoffiana</i> Cham.	X													
POACEAE (=GRAMINAE)														
<i>Agrostis scabra</i> Willd.		X							X					
<i>Alopecurus aequalis</i> Sobol.	X													
<i>Alopecurus alpinus</i> Smith			X								RE			
<i>Arctagrostis latifolia</i> (R. Br.) Griseb.						X								
<i>Arctagrostis poaeoides</i> Nash	X													
<i>Arctagrostis latifolia</i> (R. Br.) Griseb. var. <i>arundinacea</i> (Trin.) Griseb.							X							
<i>Arctagrostis latifolia</i> (R. Br.) Griseb. var. <i>latifolia</i>	X													
<i>Avena fatua</i> L.										X	rei			
<i>Beckmannia erucaeformis</i> (L.) Host ssp. <i>baicalensis</i> (Kusn.) Hult.		X								X				

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES			
	W	MD	W	MD	W	MD						
<i>Bromopsis inermis</i> (Leyss.) Holub [= <i>Bromus inermis</i> Leyss.]												
<i>Bromus tectorum</i> L.								X				
<i>Calamagrostis canadensis</i> (Michx.) Beauv.	X	X		X		X		X				
<i>Calamagrostis deschampsoides</i> Trin.												
<i>Calamagrostis inexpansa</i> Gray	X	X										
<i>Calamagrostis lapponica</i> (Wahlenb.) Hartman. F.	X	X										
<i>Calamagrostis nukaensis</i> (C. Presl) Steudel	X											
<i>Dactylis glomerata</i> L.												
<i>Deschampsia caespitosa</i> (L.) P. Beauv. ssp. <i>caespitosa</i>	X											
<i>Elymus alaskanus</i> (Scribn. & Merr.) A. Loeve ssp. <i>alaskanus</i> [= <i>Agropyron violaceum</i> (Hornem.) Lange]		X		X		X						
<i>Elymus glaucus</i> Buckley		X										
<i>Elymus sibiricus</i> L.		X										
<i>Elymus trachycaulis</i> (Link) Gould ex Shimmers ssp. <i>andinus</i> (Schribner & Smith) A.								X				
<i>Elymus trachycaulis</i> (Link) Gould ex Shimmers ssp. <i>novae-angliae</i> (Scribn.) Tzvelev								X				
[= <i>Agropyron pauciflorum</i> (Schwein.) Hitchc. ssp. <i>novae-angliae</i> (Scribn.) Melderis]		X		X								
<i>Elyrigia repens</i> (L.) Nevski [= <i>Agropyron repens</i> (L.) Beauv.]												
<i>Festuca altaica</i> Trin.				X		X						
<i>Festuca brevissima</i> Yurtsev						X						
<i>Festuca rubra</i> L.		X						X				
<i>Festuca vivipara</i> (L.) Smith						X						
<i>Glyceria borealis</i> (Nash) Batch.	X											
<i>Glyceria striata</i> (Lam.) A. Hitchc. ssp. <i>stricta</i> (Scribn.) Hult.	X											
<i>Hierchloe alpina</i> (Sw.) Roem. & Schult.				X		X						
<i>Hierchloe odorata</i> (L.) P. Beauv.		X		X								
<i>Hordeum brachyantherum</i> Nevski		X										
<i>Hordeum jubatum</i> L.		X										
<i>Leymus mollis</i> (Trin.) Hara ssp. <i>mollis</i> [= <i>Elymus arenarius</i> L. ssp. <i>mollis</i> (Trin.) Hult.]		X						X				
<i>Lolium multiflorum</i> Lam.								X				
<i>Phalaris arundinacea</i> L.	X											
<i>Phleum commutatum</i> Gaudin var. <i>americanum</i> (Fourn.) Hult.				X		X						
<i>Phleum pratense</i> L.												
<i>Poa alpigena</i> (E. Fries) Lindm.		X										
<i>Poa alpina</i> L.												
<i>Poa annua</i> L.	X					X						

FORT RICHARDSON VASCULAR PLANT SPECIES LIST												APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Poa arctica</i> R. Br.				X									
<i>Poa emimens</i> Presl		X											
<i>Poa glauca</i> M. Vahl.		X		X				X					
<i>Poa palustris</i> L.	X												
<i>Poa paucispicula</i> Scribn. & Merr.						X							
<i>Poa pratensis</i> L.						X		X					
<i>Poa psuedoabbreviata</i> Rosch.							X		re				
<i>Puccinellia grandis</i> Swallen							X						
<i>Puccinellia nutkaensis</i> (Presl) Fern. & Weath.							X		RE				
<i>Puccinellia phryganodes</i> (Trin.) Scribner & Marr.							X		RE				
<i>Schizachne purpurascens</i> (Torr.) Swallen					X								
<i>Trisetum spicatum</i> (L.) Richter								X					
<i>Trisetum spicatum</i> (L.) Richter ssp. <i>alaskanum</i> (Nash) Hult.					X								
<i>Trisetum spicatum</i> (L.) Richter ssp. <i>molle</i> (Michaux) Hult.					X								
<i>Triticum aestivum</i> L.								X					
<i>Vahlodea atropurpurea</i> (Wahlenb.) E. Fries ssp. <i>paramushirensis</i> (Kudo) Hult.					X								
POTAMOGETONACEAE													
<i>Potamogeton alpinus</i> Balb.	X												
<i>Potamogeton epihydrys</i> Raf.	X												
<i>Potamogeton filiformis</i> Pers.	X												
<i>Potamogeton gramineus</i> L.	X												
<i>Potamogeton natans</i> L.	X												
<i>Potamogeton pectinatus</i> L.	X						X?						
<i>Potamogeton richardsonii</i> (A. Bennett) Rydb. [= <i>P. perfoliatus</i> L. ssp. <i>richardsonii</i> (A. Bennett) Hult.]	X												
<i>Potamogeton praelongus</i> Wulf.	X												
<i>Potamogeton vaginatus</i> Turcz.	X												
<i>Potamogeton zosterifolius</i> Schum.	X												
<i>Ruppia spiralis</i> L.							X		RE				
<i>Zannichellia palustris</i> L.							X		RE, **				
SCHEUCHZERIAACEAE													
<i>Scheuchzeria palustris</i> L.	X												
SPARGANIACEAE													
<i>Sparganium angustifolium</i> Michx.	X												
<i>Sparganium hyperboreum</i> Laest.	X												

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Sparganium minimum</i> (Hartm.) E. Fries	X												
TYPHACEAE													
<i>Typha latifolia</i> L.	X												
Division ANTHOPHYTA: DICOTYLEDONAE													
ADOXACEAE													
<i>Adoxa moschatellina</i> L.		X											
AMARANTHACEAE													
<i>Amaranthus retroflexus</i> L.								X	rei				
APIACEAE (=UMBELLIFERAE)													
<i>Angelica genyflexa</i> Nutt.			X										
<i>Angelica lucida</i> E. Nels.		X	X	X									
<i>Cicuta douglasii</i> (DC.) J. Coulter & Rose			X										
<i>Cicuta virosa</i> L. [= <i>C. mackenziana</i> Raup]	X												
<i>Conioselinum pacificum</i> (S. Wats.) Coult. & Rose [= <i>C. chinense</i> (L.) BSP.]	X	X		X			X						
<i>Heracleum lanatum</i> Michx.		X		X				X					
<i>Ligusticum scoticum</i> L. ssp. <i>hultenii</i> (Fern.) Cald. & Tayl.							X		RE				
<i>Osmorhiza depauperata</i> Phill.		X											
ARALIACEAE													
<i>Oplopanax horridus</i> (Smith) Miquel [= <i>Echinopanax horridum</i> (Sm.) Decne. & Planch.]		X											
ASTERACEAE (=COMPOSITAE)													
<i>Achillea millefolium</i> L.													
<i>Achillea ptarmica</i> L.								X	rei				
<i>Achillea sibirica</i> Ledeb.		X						X	rei				
<i>Antennaria alpina</i> (L.) Gaertn.									RE				
<i>Antennaria friesiana</i> (Trautv.) Ekman						X							
<i>Antennaria friesiana</i> (Trautv.) Ekman ssp. <i>alaskana</i> (Malte) Hult.						X			RE				
<i>Antennaria monocephala</i> DC.						X							
<i>Antennaria rosea</i> (D.C. Eaton) E. Greene		X											
<i>Antennaria rosea</i> E. Greene ssp. <i>pulvinata</i> (E. Greene) Bayer		X											
<i>Anthemis cotula</i> L.													
<i>Anthemis tinctoria</i> L.								X	rei				
<i>Arnica griseomii</i> Fern. ssp. <i>frigida</i> (C. Meyer ex Iljin) S. J. Wolf								X	rei				
<i>Arnica latifolia</i> Bong.			X	X									
<i>Arnica lessingii</i> Greene													
<i>Arnica ovata</i> E. Greene				X		X			re				

FORT RICHARDSON VASCULAR PLANT SPECIES LIST												
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES			
	W	MD	W	MD	W	MD						
<i>Artemisia arctica</i> Less.				X		X						
<i>Artemisia tilesii</i> Ledeb.		X						X				
<i>Aster junciformis</i> Rydb.	X											
<i>Aster sibiricus</i> L.		X				X						
<i>Chrysanthemum arcticum</i> L.							X					
<i>Chrysanthemum leucanthemum</i> L.						X		X				
<i>Crepis elegans</i> Hook.						X			re			
<i>Crepis nana</i> Richards.								X	REi			
<i>Crepis tectorum</i> L.								X	rei			
<i>Erigeron acris</i> L.		X										
<i>Erigeron humilis</i> Graham						X						
<i>Erigeron peregrinus</i> (Pursh) Greene			X	X		X						
<i>Erigeron purpuratus</i> Greene						X			re			
<i>Helianthus annuus</i> L.								X	rei			
<i>Hieracium triste</i> Willd.						X			re			
<i>Matricaria matricarioides</i> (Less.) Porter								X				
<i>Petasites frigidus</i> (L.) Franchet	X		X						re			
<i>Petasites sagittatus</i> (Banks) Gray	X											
<i>Senecio lugens</i> Richardson			X									
<i>Senecio pauciflorus</i> Pursh		X										
<i>Senecio vulgaris</i> L.								X				
<i>Senecio triangularis</i> Hook.				X								
<i>Solidago lepida</i> DC.		X						X				
<i>Solidago multiradiata</i> Ait.												
<i>Taraxacum alaskanum</i> Rydb.				X		X						
<i>Taraxacum carneocoloratum</i> Nels.						X			re, **			
<i>Taraxacum officinale</i> Weber		X?				X		X				
<i>Tripleurospermum inodorum</i> (L.) Schultz-Bip.								X	rei			
BALSAMINACEAE												
<i>Impatiens noli-tangere</i> L.	X											
BETULACEAE												
<i>Alnus sinuata</i> (Regel) Rydb. [= <i>A. crispa</i> (Ait.) Pursh ssp. <i>sinuata</i> (Regel) Hult.]		X		X								
<i>Alnus tenuifolia</i> Nutt. [= <i>A. incana</i> (L.) Moench ssp. <i>tenuifolia</i> (Nutt.) Breitung]	X	X										
<i>Alnus viridis</i> Villar ssp. <i>crispa</i> (Ait.) Loeve & Loeve [= <i>A. crispa</i> (Ait.) Pursh ssp. <i>crispa</i> ]				X								
<i>Betula glandulosa</i> Michx.				X								

[illegible]

FORT RICHARDSON VASCULAR PLANT SPECIES LIST										APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST			SUB ALPINE			ALPINE		HALO-PHYTIC	DISTURBED	NOTES
	W	MD		W	MD		W	MD			
<i>Erysimum cheiranthoides</i> L. ssp. <i>altum</i> Ahti		X									
<i>Eutrema edwardsii</i> R. Br.				X	X						RE
<i>Lepidium densiflorum</i> Schrad.										X	
<i>Rorippa barbareaefolia</i> (DC.) Kitigawa		X								X	
<i>Rorippa palustris</i> (L.) Besser ssp. <i>hispida</i> (Desv.) Jonsell	X										
<i>Rorippa palustris</i> (L.) Besser ssp. <i>palustris</i>	X										
<i>Rorippa sylvestris</i> (L.) Besser										X	
<i>Thlaspi arcticum</i> Pors.								X			re, **
<b>CALLITRICHACEAE</b>											
<i>Callitriche verna</i> L. emend. Lonnrt.	X			X							
<b>CAMPANULACEAE</b>											
<i>Campanula lasiocarpa</i> Cham.								X			
<i>Campanula rotundifolia</i> L.		X			X						
<i>Campanula uniflora</i> L.								X			RE
<b>CAPRIFOLIACEAE</b>											
<i>Linnaea borealis</i> L.		X			X						
<i>Sambucus racemosa</i> L.		X									
<i>Viburnum edule</i> (Michx.) Raf.		X									
<b>CARYOPHYLLACEAE</b>											
<i>Cerastium arvense</i> L.					X						
<i>Cerastium beerianum</i> Cham. & Schlecht. var. <i>beerianum</i>								X			
<i>Cerastium fontanum</i> Baumg.										X	
<i>Gastrolychnis apetala</i> (L.) Tolm & Koz. [= <i>Melandrium apetalum</i> (L.) Fenzl.]								X			
<i>Melandrium noctiflorum</i> (L.) Fries										X	rei
<i>Minuartia biflora</i> (L.) Sching & Thell.								X			re
<i>Minuartia macrocarpa</i> (Pursh) Ostenf.								X			
<i>Minuartia rubella</i> (Wahlenb.) Graebn.								X			
<i>Moehringia lateriflora</i> (L.) Fenzl		X			X						
<i>Sagina nivalis</i> (Lindblom) Fries								X			
<i>Sagina saginoides</i> (L.) Karst.		X			X						
<i>Silene acaulis</i> L.								X			
<i>Spargula arvensis</i> L.										X	rei
<i>Spargularia canadensis</i> (Pers.) G. Don									X		RE
<i>Stellaria borealis</i> Bigelow	X	X			X						re
<i>Stellaria borealis</i> Bigelow ssp. <i>sitchensa</i> Steud.	X	X			X						RE



FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES			
	W	MD	W	MD	W	MD						
<i>Stellaria calycantha</i> (Ledeb.) Bong.	X	X	X	X								
<i>Stellaria crassifolia</i> Ehrh.		X							RE			
<i>Stellaria humifusa</i> Rottb.							X		re			
<i>Stellaria laeta</i> Richards.						X						
<i>Stellaria longifolia</i> Muhl. ex Willd.		X						X				
<i>Stellaria media</i> (L.) Villars												
<i>Stellaria monantha</i> Hult.				X		X						
<i>Stellaria umbellata</i> Turcz.						X			RE, **			
CHENOPODIACEAE												
<i>Atriplex gmelini</i> C.A. Meyer							X		**			
<i>Chenopodium album</i> L.								X				
<i>Salicornia europaea</i> L.							X		**			
CORNACEAE												
<i>Cornus canadensis</i> L.		X										
<i>Cornus suecica</i> L.						X						
<i>Swida stolonifera</i> (Michx.) Rydb. [= <i>Cornus stolonifera</i> Michx.]		X										
CRASSULACEAE												
<i>Rhodiola integrifolia</i> Raf. [= <i>Sedum rosea</i> (L.) Scop. ssp. <i>integrifolia</i> (Raf.) Hult.]						X						
DIAPENSACEAE												
<i>Diapensia lapponica</i> L.						X						
DROSERACEAE												
<i>Drosera anglica</i> Huds.		X										
<i>Drosera rotundifolia</i> L.		X		X								
ELAEAGNACEAE												
<i>Shepherdia canadensis</i> (L.) Nutt.		X		X								
EMPETRACEAE												
<i>Empetrum hermaphroditum</i> (Lange) Hagerup [= <i>E. nigrum</i> L. ssp. <i>hermaphroditum</i> (Lange) Boecher]		X		X		X						
<i>Empetrum nigrum</i> L.		X		X		X						
ERICACEAE												
<i>Andromeda polifolia</i> L.	X											
<i>Arctostaphylos uva-ursi</i> (L.) Sprengel		X		X		X						
<i>Arctous alpina</i> (L.) Niedenzu [= <i>Arctostaphylos alpina</i> (L.) Spreng.]				X		X						
<i>Arctous rubra</i> (Rehd. & Wilson) Nakai [= <i>Arctostaphylos rubra</i> (Rehd. & Wilson) Fern.]						X						

FORT RICHARDSON VASCULAR PLANT SPECIES LIST												APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Cassiope lycopodioides</i> (Pall.) D. Don													
<i>Cassiope stelleriana</i> (Pall.) DC.				X									
<i>Cassiope tetragona</i> (L.) D. Don				X									
<i>Chamaedaphne calyculata</i> (L.) Moench	X												
<i>Ledum groenlandicum</i> Oeder [= <i>L. palustre</i> L. ssp. <i>groenlandicum</i> (Oeder) Hult.]	X	X											
<i>Ledum palustre</i> L. ssp. <i>decumbens</i> (Ait.) Hult.				X									
<i>Loiseleuria procumbens</i> (L.) Desv.				X									
<i>Menziesia ferruginea</i> Sm.		X											
<i>Oxycoccus microcarpus</i> Turcz. ex Rupr.	X		X										
<i>Phyllodoce aleutica</i> (Spreng.) A. A. Heller													
<i>Vaccinium caespitosum</i> Michx.				X									
<i>Vaccinium ovalifolium</i> Sm.				X									
<i>Vaccinium uliginosum</i> L.	X	X		X									
<i>Vaccinium vitis-idaea</i> L.		X		X									
FABACEAE (=LEGUMINOSAE)													
<i>Astragalus alpinus</i> L.		X						X					
<i>Astragalus alpinus</i> L. ssp. <i>alpinus</i>		X						X					
<i>Astragalus polaris</i> Benth.									RE				
<i>Astragalus umbellatus</i> Bunge				X					re				
<i>Hedysarum alpinum</i> L.		X											
<i>Lathyrus palustris</i> L. ssp. <i>pilosus</i> (Cham.) Hult.		X					X						
<i>Lupinus nootkatensis</i> Donn		X		X									
<i>Lupinus polyphyllus</i> Lindl.		X		X									
<i>Medicago falcata</i> L.								X	rei				
<i>Medicago sativa</i> L.								X	rei				
<i>Meilotus albus</i> Desr.								X					
<i>Meilotus officinalis</i> (L.) Lam.								X					
<i>Oxytropis bryophila</i> (E. Greene) Yurtsev													
<i>Oxytropis huddelsonii</i> Pors.									RE, **				
<i>Oxytropis maydelliana</i> Trautv.													
<i>Oxytropis varians</i> (Rydb.) Schumann													
<i>Trifolium hybridum</i> L.								X					
<i>Trifolium pratense</i> L.								X					
<i>Trifolium repens</i> L.								X					
<i>Vicia cracca</i> L.								X					



FORT RICHARDSON VASCULAR PLANT SPECIES LIST										APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST			SUB ALPINE			ALPINE		HALO-PHYTIC	DISTURBED	NOTES
	W	MD		W	MD		W	MD			
<i>Utricularia vulgaris</i> L. ssp. <i>macrorrhiza</i> (LeConte) Clauson	X										
MYRICACEAE											
<i>Myrica gale</i> L.	X										
NYMPHACEAE											
<i>Nuphar polysepalum</i> Engelm.	X										
ONAGRACEAE											
<i>Circaea alpina</i> L.	X										
<i>Epilobium anagallidifolium</i> Lam.				X	X		X				
<i>Epilobium angustifolium</i> L.		X									
<i>Epilobium ciliatum</i> Raf. ssp. <i>glandulosum</i> (Lehm.) Hoch & Raven [= <i>E. glandulosum</i> Lehm.]				X			X				
<i>Epilobium hornemannii</i> Reichenb. ssp. <i>hornemannii</i>				X							
<i>Epilobium latifolium</i> L.		X			X			X		X	
<i>Epilobium palustre</i> L.	X										
OROBANCHACEAE											
<i>Boschniakia rossica</i> (Cham & Schltdl.) B. Fedtsch.		X									
PAPAVERACEAE											
<i>Papaver alboroseum</i> Hult.								X			**
<i>Papaver nudicaule</i> L.										X	
<i>Papaver radicatum</i> Rottb. ssp. <i>radicatum</i>								X			
PLANTAGINACEAE											
<i>Plantago major</i> L. var. <i>major</i>										X	
<i>Plantago maritima</i> L. ssp. <i>juncoides</i> (Lam.) Hult.									X		
PLUMBAGINACEAE											
<i>Armeria maritima</i> (Mill.) Willd. ssp. <i>arctica</i> (Cham.) Hult.								X			RE
POLEMONIACEAE											
<i>Polemonium acutiflorum</i> Willd.	X			X							
<i>Polemonium pulcherrimum</i> Hook.		X								X	
POLYGONACEAE											
<i>Bistorta vivipara</i> (L.) Gray [= <i>Polygonum viviparum</i> L.]				X				X			
<i>Oxyria digyna</i> (L.) Hill					X			X			
<i>Polygonum amphibium</i> L.	X										
<i>Polygonum aviculare</i> L.										X	

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

FORT RICHARDSON VASCULAR PLANT SPECIES LIST												APRIL 18, 1995			
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES						
	W	MD	W	MD	W	MD									
<i>Polygonum convolvulus</i> L.								X							
<i>Polygonum fowleri</i> Robins.							X		RE						
<i>Polygonum lapathifolium</i> L.	X								rei						
<i>Polygonum pennsylvanicum</i> L. ssp. <i>oneillii</i> (Brenckle) Hult.	X														
<i>Rumex acetosella</i> L.								X							
<i>Rumex arcticus</i> Trautv.			X												
<i>Rumex crispus</i> L.															
<i>Rumex fenestratus</i> Greene	X							X							
<i>Rumex transitorius</i> K. H. Resch	X								RE						
PORTULACACEAE															
<i>Claytonia sarmentosa</i> C. Meyer								X							
PRIMULACEAE															
<i>Dodecatheon pulchellum</i> (Raf.) Merr.															
<i>Douglasia alaskana</i> (Cov. & Stand. ex Hult.) S. Kelso [= <i>Androsace alaskana</i> Cov. & Stand.]							X		**						
<i>Glaux maritima</i> L.							X								
<i>Lysimachia thyrsiflora</i> L.	X						X?								
<i>Primula cuneifolia</i> Ledeb. ssp. <i>saxifragifolia</i> (Lehm.) Smith & Forrest							X								
<i>Trientalis europaea</i> L.	X	X	X	X			X								
PYROLACEAE															
<i>Moneses uniflora</i> (L.) Gray		X													
<i>Orthilia secunda</i> (L.) House [= <i>Pyrola secunda</i> L. ssp. <i>secunda</i> ]		X		X			X								
<i>Pyrola asarifolia</i> Michx.		X		X											
<i>Pyrola asarifolia</i> Michx. var. <i>purpurea</i> (Bunge) Fern.		X		X											
<i>Pyrola chlorantha</i> Sw.		X													
<i>Pyrola minor</i> L.		X		X			X								
RANUNCULACEAE															
<i>Aconitum delphinifolium</i> DC.		X		X											
<i>Aconitum delphinifolium</i> DC. ssp. <i>paradoxicum</i> (Reichb.) Maguire & Hult.							X		RE						
<i>Actaea rubra</i> (Ait.) Willd.		X		X					re, **						
<i>Anemone multifida</i> Poir. var. <i>saxicola</i> B. Boivan							X								
<i>Anemone narcissiflora</i> L. var. <i>monantha</i> DC.							X								
<i>Anemone narcissiflora</i> L. ssp. <i>villosissima</i> (DC.) Hult.		X		X			X		RE						
<i>Anemone parviflora</i> Michx.							X								
<i>Anemone richardsonii</i> Hock.	X			X											
<i>Aquilegia formosa</i> Fisch.		X		X											

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995	
PLANT NAME	LOWLAND FOREST			SUB ALPINE			ALPINE			HALO-PHYTIC	DISTURBED	NOTES
	W	MD		W	MD		W	MD				
<i>Caltha palustris</i> L. sp. <i>asarifolia</i> (DC.) Hult.	X											
<i>Delphinium glaucum</i> S. Wats.		X			X							
<i>Ranunculus arborvitus</i> L.											X	
<i>Ranunculus cymbalaria</i> Pursh										X		
<i>Ranunculus eschscholtzii</i> Schlecht.							X	X				
<i>Ranunculus gmelini</i> DC. ssp. <i>gmelini</i>	X											
<i>Ranunculus hyperboreus</i> Rottb.	X?			X			X					
<i>Ranunculus lapponicus</i> L.	X											
<i>Ranunculus macounii</i> Britt.												
<i>Ranunculus nivalis</i> L.									X			
<i>Ranunculus occidentalis</i> Nutt.												
<i>Ranunculus pygmaeus</i> Wahl.				X	X			X				
<i>Ranunculus scleratus</i> L. ssp. <i>multifidus</i> (Nutt.) Hult.	X											
<i>Ranunculus trichophyllus</i> Chaix	X											
<i>Ranunculus trichophyllus</i> Chaix var. <i>trichophyllus</i>	X											
<i>Thalictrum alpinum</i> L.									X			re
<i>Thalictrum sparsiflorum</i> Trucz.		X										
ROSACEAE												
<i>Acomastylis rossii</i> (R. Br.) E. Greene [= <i>Geum rossii</i> (R. Br.) Ser. ex DC.]									X			
<i>Amelanchier alnifolia</i> (Nutt.) Nutt.		X			X							
<i>Comarum palustre</i> L. [= <i>Potentilla palustris</i> (L.) Scop.]	X											
<i>Dryas alaskensis</i> Pors. [= <i>D. octopetala</i> L. ssp. <i>alaskensis</i> (Pors.) Hult.]									X			
<i>Dryas drummondii</i> Richards.		X										
<i>Dryas integrifolia</i> Vahl.									X?			
<i>Dryas octopetala</i> L.									X			
<i>Fragaria chiloensis</i> (L.) Duchesne											X	
<i>Geum macrophyllum</i> Willd. ssp. <i>macrophyllum</i>		X										
<i>Geum perincisum</i> Rydb. [= <i>G. macrophyllum</i> Willd. ssp. <i>perincisum</i> (Rydb.) Raup.]		X										RE
<i>Luetkea pectinata</i> (Pursh) Ktze.												
<i>Pentaptylloides floribunda</i> (Pursh.) Loeve [= <i>Potentilla fruticosa</i> L.]	X	X			X				X			
<i>Potentilla anserina</i> L.											X	
<i>Potentilla diversifolia</i> Lehm.									X			
<i>Potentilla egedii</i> Wormsk. ssp. <i>grandis</i> (Torr. & Gray) Hult.										X		
<i>Potentilla hyparctica</i> Malte									X			re
<i>Potentilla multifida</i> L.		X			X				X		X	

## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Potentilla norvegica</i> L.									X				
<i>Potentilla uniflora</i> Ledeb.										X			
<i>Rosa acicularis</i> Lindl.		X		X									
<i>Rosa nulkana</i> Presl		X											
<i>Rubus arcticus</i> L.			X										
<i>Rubus chamaemorus</i> L.	X		X										
<i>Rubus idaeus</i> L.		X		X									
<i>Rubus pedatus</i> Sm.			X	X									
<i>Rubus stellatus</i> Sm. [= <i>R. arcticus</i> L. ssp. <i>stellatus</i> (Sm.) Boiv. emend. Hult.]				X									
<i>Sanguisorba stipulata</i> Raf.	X	X	X	X									
<i>Sibbaldia procumbens</i> L.				X						X			
<i>Sorbus scopulina</i> Greene		X		X									
<i>Spiraea beauverdiana</i> Schneid.	X			X									
RUBIACEAE													
<i>Galium boreale</i> L.		X		X					X				
<i>Galium trifidum</i> L. ssp. <i>trifidum</i>	X												
<i>Galium triflorum</i> Michx.	X												
SALICACEAE													
<i>Populus balsamifera</i> L.		X		X									
<i>Populus balsamifera</i> L. ssp. <i>balsamifera</i>		X		X									
<i>Populus balsamifera</i> L. ssp. <i>trichocarpa</i> (Torr. & Gray) Brayshaw		X											
<i>Populus tremuloides</i> Michx.		X		X									
<i>Salix alaxensis</i> (Anderss.) Cov.		X		X									
<i>Salix arctica</i> Pall.									X				
<i>Salix barclayi</i> Anderss.			X										
<i>Salix bebbiana</i> Sarg. [= <i>S. depressa</i> L. ssp. <i>rostrata</i> (Anderss.) Hiitonen] <i>niphoclada</i> ]		X											
<i>Salix brachycarpa</i> Nutt. ssp. <i>niphoclada</i> (Rydb.) Argus			X	X					X				
<i>Salix fuscescens</i> Anderss.	X												
<i>Salix glauca</i> L.				X					X				
<i>Salix lucida</i> Muhlb. ssp. <i>lasianдра</i> (Benth.) Argus [= <i>S. lasianдра</i> Benth.]	X												
<i>Salix ovalifolia</i> Trautv.									X				
<i>Salix planifolia</i> Pursh ssp. <i>pulchra</i> (Cham.) Argus [= <i>S. pulchra</i> Cham.]				X					X				
<i>Salix reticulata</i> L.				X					X				
<i>Salix rotundifolia</i> Trautv.													
<i>Salix scouleriana</i> Barratt		X							X				



FORT RICHARDSON VASCULAR PLANT SPECIES LIST											APRIL 18, 1995		
PLANT NAME	LOWLAND FOREST		SUB ALPINE		ALPINE		HALO-PHYTIC	DISTURBED	NOTES				
	W	MD	W	MD	W	MD							
<i>Salix sitchensis</i> Sanson	X		X?										
SANTALACEAE													
<i>Geocaulon lividum</i> (Richards.) Fern.		X		X									
SAXIFRAGACEAE													
<i>Chrysosplenium tetrandrum</i> (Lund) T. Fries	X		X										
<i>Heuchera glabra</i> Willd.	X	X	X	X									
<i>Leptarrhena pyrolifolia</i> (D. Don) Ser.			X		X								
<i>Mitella pentandra</i> Hook.			X	X									
<i>Parnassia kotzebuei</i> Cham. & Schlecht.	X		X	X									
<i>Parnassia palustris</i> L.	X		X										
<i>Parnassia palustris</i> L. ssp. <i>neogaea</i> (Fern.) Hult.	X		X										
<i>Saxifraga adscendens</i> L.						X							
<i>Saxifraga bronchialis</i> L.						X							
<i>Saxifraga caespitosa</i> L.						X			re				
<i>Saxifraga calycina</i> Sternb.						X			RE				
<i>Saxifraga cernua</i> L.						X			RE				
<i>Saxifraga eschscholtzii</i> Sternb.						X			re				
<i>Saxifraga flagellaris</i> Willd.						X			RE				
<i>Saxifraga foliolosa</i> R. Br.						X?	X						
<i>Saxifraga lyallii</i> Engler ssp. <i>hultenii</i> (Cald. & Sav.) Cald. & Sav.			X		X	X							
<i>Saxifraga hirculus</i> L.					X	X			re				
<i>Saxifraga nelsoniana</i> D. Don [= <i>S. punctata</i> L. ssp. <i>pacifica</i> Hult.]					X	X							
<i>Saxifraga nivalis</i> L.						X							
<i>Saxifraga oppositifolia</i> L.						X							
<i>Saxifraga rivularis</i> L.													
<i>Saxifraga serpyllifolia</i> Pursh						X			re				
<i>Saxifraga tricuspidata</i> Rottb.						X	X						
SCROPHULARACEAE													
<i>Castilleja unalaschensis</i> (Cham. & Schlecht.) Malte			X	X				X					
<i>Euphrasia disjuncta</i> Fern & Wieg.		X						X					
<i>Linaria vulgaris</i> Mill.								X					
<i>Mimulus guttatus</i> DC.	X												
<i>Pedicularis capitata</i> Adams.				X		X							
<i>Pedicularis labradorica</i> Wirsing	X		X	X		X							
<i>Pedicularis lanata</i> Cham. & Schlecht						X			RE				



## FORT RICHARDSON VASCULAR PLANT SPECIES LIST

APRIL 18, 1995

PLANT NAME	LOWLAND FOREST										SUB ALPINE				ALPINE		HALO-PHYTIC	DISTURBED	NOTES
	FOREST										ALPINE		ALPINE						
	W	MD	W	MD	W	MD	W	MD	W	MD	W	MD							
<i>Pedicularis langsdoerffii</i> Fisch. ex Steven										X	X								
<i>Pedicularis verticillata</i> L.											X								
<i>Rhinanthus minor</i> L.			X	X						X	X					X			
<i>Veronica americana</i> Schwein.			X																
<i>Veronica wormskjoldii</i> Roem & Schult.											X								
URTICACEAE																			
<i>Urtica dioica</i> L. ssp. <i>gracilis</i> (Aiton) Selandier			X																
VALERIANACEAE																			
<i>Valeriana capitata</i> Pall.											X								
<i>Valeriana sitchensis</i> Bong.											X								
VIOLACEAE																			
<i>Viola epipsila</i> Ledeb.			X																
<i>Viola langsdoerffii</i> Fisch.										X	X								
<i>Viola renifolia</i> Gray				X															
<i>Viola selkirkii</i> Pursh											X						**		

**Appendix E  
Fort Richardson Vascular  
Plants Currently Being  
Tracked by the Alaska Natural  
Heritage Program's Biological  
Conservation Database for  
South-Central Alaska With  
Global (G) and State (S)  
Rankings**

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**FORT RICHARDSON VASCULAR PLANTS CURRENTLY BEING TRACKED BY  
AKNHP'S BIOLOGICAL CONSERVATION DATABASE FOR SOUTHCENTRAL  
ALASKA WITH GLOBAL (G) AND STATE (S) RANKINGS.**

COL#	TAXON	RANK
360	<i>Anemone multifida</i> Poir. var. <i>saxicola</i> B. Boivan	G4G5QS2S3
703	<i>Aphragmus eschscholtzianus</i> Andr.	G3S2S3
860		
1012	<i>Atripex gmlini</i> C.A. Meyer	G5SR
1120		
1147		
1168		
8070		
422	<i>Carex deweyana</i> Schwein	G5S1SE
8020	<i>Douglasia alaskana</i> (Cov. & Stand. ex Hult.) S. Kelso	G2G3S2S3
8076		
795		
695	<i>Draba ruaxes</i> Payson & St. John	G2G3S2
8038		
191	<i>Draba stenopetala</i> Trautv.	G3S2
389		
471	<i>Eleocharis kamtschatica</i> (C.A. Meyer) Kam.	G4S2
472		
1141		
1146		
939	<i>Eleocharis quinquefolia</i> (F. Hartmann) O. Schwarz	G5S1

923	<i>Eriophorum viridi-carinatum</i> (Englem.) Fern.	G5S2
1042		
135	<i>Glyceria striata</i> (Lam.) Hitchc. ssp. <i>stricta</i> (Scribn.) Hult.	G5T5QS2
955		
225	<i>Hammarbya paludosa</i> (L.) Ktze.	G5S2
545		
932		
988	<i>Malaxis monophylla</i> (L.) Sw. var. <i>brachypoda</i> (A. Gray) Morris & Ames	G5T5S3S4
715		
8032		
8077A		
1019	<i>Myriophyllum verticillatum</i> L.	G5S3
1030	<i>Najas flexilis</i> (Willd.) Rost. & Schmidt	G5S1S2
1117		
1100	<i>Oxytropis huddelsonii</i> Pors.	G3S2S3
689	<i>Papaver alboroseum</i> Hult.	G3S3
8093		
487	<i>Salicornia europaea</i> L.	G5NES2
381	<i>Saxifraga adscendens</i> L. ssp. <i>oregonensis</i> (Raf.) Bacigalupi	G5T4T5S2S3
700		
180	<i>Saxifraga eschscholtzii</i> Sternb.	G4S3S4
375		
699		
883		
8101		

409	<i>Smilacina stellata</i> (L.) Desf.	G5S2
1086	<i>Stellaria umbellata</i> Turcz.	G4S1S2
1115		
8082A	<i>Taraxacum carneocoloratum</i> Nels.	G2QS2
698	<i>Thlaspi arcticum</i> Pors.	G3S3
8037		
8085		
414	<i>Viola selkirkii</i> Pursh	G5?S3
626	<i>Zannichellia palustris</i> L.	G5S2S3
1169		

# **Appendix F**

## **Identified Cryptogams at Fort Richardson (With Synonyms)**

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Prepared by Dr. Barbara Murray

IDENTIFIED CRYPTOGRAMS AT FORT RICHARDSON (WITH COMMON SYNONYMS)  
PREPARED BY BARBARA MURRAY  
MAY 1995

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Lichens

*Alectoria nigricans* (Ach.) Nyl.  
*Alectoria ochroleuca* (Hoffm.) A.Massal.  
*Asahinea chrysantha* (Tuck.) W.L.Culb. & C.F.Culb.  
    *Cetraria chrysantha* Tuck.  
*Asahinea scholanderi*  
*Bryocaulon divergens* (Ach.) Kärnefelt  
    *Cornicularia divergens* Ach.  
*Bryoria nitidula* (Th.Fr.) Brodo & D.Hawksw.  
    *Alectoria lanea* auct.  
*Candelariella terrigena* Räsänen  
*Cetraria chlorophylla*  
*Cetraria hepatizon*  
*Cetraria islandica* (L.) Ach.  
*Cetraria kamczatica* Savicz  
*Cetraria muricata* (Ach.) Eckfeldt  
    *Coelocaulon muricatum* (Ach.) J.R.Laundon  
    *Cornicularia muricata* (Ach.) Ach.  
*Cetraria nigricans* Nyl.  
*Cetraria sepincola*  
*Cetrariella delisei* (Bory ex Schaer.) Kärnefelt & A.Thell  
    *Cetraria delisei* (Bory ex Schaer.) Nyl.  
    *Cetraria hiaseus* (Fr.) Th.Fr.  
*Cetrariella fastigiata* (Delise ex Nyl.in Norrl.) Kärnefelt & A.Thell  
    *Cetraria fastigiata* (Delise ex Nyl.in Norrl.) Kärnefelt  
*Cladina aberrans* (Abbeyes) Hale & W.L.Culb.  
    *Cladonia aberrans* (Abbeyes) Stuck.  
    *Cladina stellaris* (Opiz) Brodo var. *aberrans* (Abbeyes) Ahti  
*Cladina arbuscula* (Wallr.) Hale & W.L.Culb.  
    *Cladonia arbuscula* (Wallr.) Flot.  
*Cladina mitis* (Sandst.) Hustich  
    *Cladonia mitis* Sandst.  
*Cladina rangiferina* (L.) Nyl.  
    *Cladonia rangiferina* (L.) F.H.Wigg.  
*Cladina stellaris* (Opiz) Brodo  
    *Cladonia alpestris* (L.) Rabenh.  
    *Cladonia stellaris* (Opiz) Pouzar & Vezda  
*Cladonia acuminata* (Ach.) Norrl.

*Cladonia amaurocraea* (Flörke) Schaer.  
*Cladonia amaurocraea* (Flörke) Schaer. forma *celotea* Ach.  
*Cladonia bellidiflora* (Ach.) Schaer.  
*Cladonia borealis* S.Stenroos  
*Cladonia cariosa* (Ach.) Spreng.  
*Cladonia carneola* (Fr.) Fr.  
*Cladonia cenotea*  
*Cladonia cervicornis* (Ach.) Flot.  
*Cladonia chlorophaea* (Flörke ex Sommerf.) Spreng.  
*Cladonia pyxidata* (L.) Hoffm. subsp. *chlorophaea* (Flörke ex Sommerf.) Spreng.  
*Cladonia coccifera* (L.) Willd.  
*Cladonia coccifera* (L.) Willd. var. *coccifera*  
*Cladonia cornuta* (L.) Hoffm.  
*Cladonia crispata* (Ach.) Flot.  
*Cladonia crispata* (Ach.) Flot. var. *crispata*  
*Cladonia deformis* (L.) Hoffm.  
*Cladonia ecmocyna* Leight.  
*Cladonia ecmocyna* Leight. subsp. *ecmocyna*  
*Cladonia fimbriata* (L.) Fr.  
*Cladonia major* (K.Hagen) Sandst.  
*Cladonia gracilis* (L.) Willd. subsp. *gracilis*  
*Cladonia gracilis* (L.) Willd. var. *gracilis*  
*Cladonia gracilis* (L.) Willd. subsp. *turbinata* (Ach.) Ahti  
*Cladonia gracilis* (L.) Willd. var. *dilatata* (Hoffm.) Vain.  
*Cladonia gracilis* (L.) Willd. subsp. *vulnerata* Ahti  
*Cladonia kanewskii* Oksner  
*Cladonia nipponica* Asahina var. *aculeata* Asahina  
*Cladonia nipponica* Asahina var. *sachalinensis*  
*Cladonia ochrochlora* Flörke  
*Cladonia phyllophora* Ehrh.ex Hoffm.  
*Cladonia degenerans* (Flörke) Spreng.  
*Cladonia pleurota* (Flörke) Schaer.  
*Cladonia coccifera* (L.) Willd. var. *pleurota* (Flörke) Vain.  
*Cladonia pocillum* (Ach.) Grognot  
*Cladonia pseudostellata* Asahina  
*Cladonia pyxidata* (L.) Hoffm.  
*Cladonia singularis* S.Hammer  
[Note: a recently described species, new to Alaska]  
*Cladonia squamosa* Hoffm. var. *squamosa*  
*Cladonia subulata* (L.) F.Weber ex F.H.Wigg.  
*Cladonia sulphurina* (Michx.) Fr.  
*Cladonia deformis* (L.) Hoffm. var. *gonecha* (Ach.) Arnold  
*Cladonia thomsonii* Ahti  
*Cladonia uncialis* (L.) F.Weber ex F.H.Wigg.  
*Dactylina arctica* (Richardson) Nyl.



*Dactylina ramulosa* (Hook.) Tuck.  
*Flavocetraria cucullata* (Bellardi) Kärnefelt & A.Thell  
*Cetraria cucullata* (Bellardi) Ach.  
*Flavocetraria nivalis* (L.) Kärnefelt & A.Thell subsp. *nivalis*  
*Cetraria nivalis* (L.) Ach.  
*Hypogymnia austerodes*  
*Hypogymnia bitteri*  
*Hypogymnia physodes*  
*Hypogymnia subobscura* (Vain.) Poelt  
*Lobaria linita* (Ach.) Rabenh.  
*Lobaria pulmonaria*  
*Lobaria scrobiculata*  
*Lopadium pezizoideum* (Ach.) Körb.  
*Nephroma arcticum* (L.) Torss.  
*Nephroma bellum*  
*Nephroma expallidum* (Nyl.) Nyl.  
*Nephroma parile*  
*Ochrolechia frigida* (Sw.) Lynge  
*Ophioparma lapponicum*  
*Pannaria pezizoides* (Weber) Trevisan  
*Parmelia hygrophila*  
*Parmelia omphalodes* (L.) Ach.  
*Parmelia saxatilis*  
*Parmelia squarrosa*  
*Parmelia stygia*  
*Parmelia sulcata*  
*Parmeliopsis ambigua*  
*Peltigera aphthosa* (L.) Willd.  
*Peltigera aphthosa* (L.) Willd. var. *aphthosa*  
*Peltigera canina* (L.) Willd.  
*Peltigera didactyla* (With.) J.R.Laundon  
*Peltigera spuria* (Ach.) DC.  
*Peltigera horizontalis* (Huds.) Baumg.  
*Peltigera lepidophora* (Nyl. ex Vain.) Bitter  
*Peltigera leucophlebia* (Nyl.) Gyeln.  
*Peltigera aphthosa* (L.) Willd. var. *leucophlebia* Nyl.  
*Peltigera malacea* (Ach.) Funck  
*Peltigera membranacea* (Ach.) Nyl.  
*Peltigera praetextata* (Flörke ex Sommerf.) Zopf  
*Peltigera rufescens* (Weiss) Humb.  
*Peltigera canina* (L.) Willd. var. *rufescens* (Weiss) Mudd  
*Peltigera scabrosa* Th.Fr.  
*Physica dubia*  
*Platismatia glauca*  
*Pseudephebe pubescens*

*Pseudocyphellaria crocata*  
*Psoroma hypnorum* (Vahl) S.Gray  
*Ramalina thrausta*  
*Rhizocarpon geographicum*  
*Solorina crocea* (L.) Ach.  
*Sphaerophorus fragilis* (L.) Pers.  
*Sphaerophorus globosus* (Huds.) Vain.  
     *Sphaerophorus coralloides* Pers.  
*Stereocaulon alpinum* Laurer ex Funck  
*Stereocaulon arenarium* (Savicz) I.M.Lamb  
*Stereocaulon glareosum* (Savicz) H.Magn.  
*Stereocaulon glareosum* (Savicz) H.Magn.var. *brachyphylloides* I.M.Lamb  
*Stereocaulon glareosum* (Savicz) H.Magn.var. *glareosum*  
*Stereocaulon grande* (H.Magn.) H.Magn.  
*Stereocaulon groenlandicum* (Å.E.Dahl) I.M.Lamb  
*Stereocaulon paschale* (L.) Hoffm.  
*Stereocaulon rivulorum* H.Magn.  
*Stereocaulon tomentosum* Fr.  
*Thamnia subuliformis* (Ehrh.) W.L.Culb.  
*Thamnia vermicularis* (Sw.) Ach. ex Schaer.  
*Umbilicaria proboscidea*  
*Umbilicaria rigida*  
*Umbilicaria torrefacta*  
*Vulpicida pinastri*  
*Vulpicida tilesii* (Ach.) J.E.Mattson & M.J.Lai  
     *Cetraria tilesii* Ach.  
*Xanthoria candelaria*

## Hepatics

*Aneura pinguis* (L.) Dumort.  
*Barbilophozia kunzeana* (Huebener) Gams  
     *Orthocaulis kunzeanus* (Huebener) H.Buch  
*Barbilophozia lycopodioides* (Wallr.) Loeske  
*Barbilophozia quadriloba*  
*Blasia pusilla* L.  
*Blepharostoma trichophyllum* (L.) Dumort.  
*Cephalozia ambigua*  
*Cephalozia bicuspidata* (L.) Dumort.  
     *Cephalozia lammersiana* (Huebener) Carring.  
*Gymnocolea acutiloba* (Schiffn.) Müll.Frib.  
     *Gymnocolea inflata* (Huds.) Dumort. var. *acutiloba* (Kaal.) S.W.Arnell  
*Gymnomitrium obtusum*

*Jungermannia subelliptica* (Lindb. ex Kaal.) Levier  
*Lophozia longidens* (Lindb.) Macoun  
*Lophozia ventricosa*  
*Pellia neesiana* (Gottsche) Limpr.  
*Pleurocladula albescens* (Hook.) Grolle  
     *Pleuroclada albescens* (Hook.) Spruce  
*Ptilidium californicum*  
*Ptilidium pulcherrimum*  
*Ptilidium ciliare* (L.) Hampe  
*Scapania scandica*

### Mosses

*Abietinella abietina* (Hedw.) M.Fleisch.  
     *Thuidium abietinum* (Hedw.) Schimp.in Bruch, Schimp.& W.Gümbel  
*Andreaea blyttii*  
*Andreaea nivalis*  
*Andreaea rupestris*  
*Aulacomnium androgynum* (Hedw.) Schimp.  
*Aulacomnium palustre* (Hedw.) Schwägr.  
*Bartramia ithyphylla* Brid.  
*Brachythecium turgidum*  
*Bryoerythrophyllum recurvitostre*  
*Bryum caespiticiu* Hedw.  
*Bryum pseudotriquetrum* (Hedw.) P.Gaertn., B.Mey.& Scherb.  
     *Bryum neodamense* Itzigs.  
     *Bryum ovatum* Jur.  
*Buxbaumia aphylla* Hedw.  
*Calliergon cordifolium* (Hedw.) Kindb.  
*Calliergon richardsonii* (Mitt.) Kindb.  
*Calliergon stramineum* (Brid.) Kindb.  
*Ceratodon purpureus* (Hedw.) Brid.  
*Climacium dendroides* (Hedw.) F.Weber & D.Mohr  
*Conostomum tetragonum* (Hedw.) Lindb.  
*Cratoneuron filicinum*  
*Dicranella schreberiana*  
*Dicranoweisia crispula* (Hedw.) Lindb.ex Milde  
*Dicranum brevifolium* (Lindb.) Lindb.  
*Dicranum elongatum* Schleich.ex Schwägr.  
*Dicranum majus* Sm.  
*Dicranum polysetum* Sw.  
*Dicranum scoparium* Hedw.  
*Distichium capillaceum* (Hedw.) Bruch, Schimp.& W.Gümbel

*Ditrichum flexicaule*  
*Drepanocladus aduncus* (Hedw.) Warnst.  
*Drepanocladus badius*  
*Drepanocladus exannulatus*  
*Drepanocladus trichophyllus*  
*Encalypta brevicolla* (Bruch & Schimp.in Bruch, Schimp.& W.Gümbel) Bruch ex Ångstr.var. *BREVICOLLA*  
*Encalypta brevicolla* (Bruch & Schimp.in Bruch, Schimp.& W.Gümbel) Bruch ex Ångstr.subsp. *brevicolla*  
*Encalypta brevipes* Schljakov  
*Encalypta procera*  
*Encalypta rhaptocarpa* Schwägr.  
*Encalypta vulgaris* Hedw.var. *rhabdocarpa* (Schwägr.) E.Lawton  
*Eurhynchium pulchellum* (Hedw.) Jenn.  
*Hylocomiastrum pyrenaicum* (Spruce) M.Fleisch.in Broth.  
*Hylocomium pyrenaicum* (Spruce) Lindb.  
*Hylocomium splendens* (Hedw.) Schimp.in Bruch, Schimp.& W.Gümbel  
*Hylocomium alaskanum* (Lesq.& James) Austin  
*Hylocomium splendens* (Hedw.) Schimp.in Bruch, Schimp.& W.Gümbel  
var. *alaskanum* (Lesq.& James) Limpr.  
*Hylocomium splendens* (Hedw.) Schimp.in Bruch, Schimp.& W.Gümbel  
var. *obtusifolium* (Geh.) Par.  
*Hypnum revolutum*  
*Kiaeria blyttii* (Schimp.) Broth.  
*Arctoa blyttii* (Schimp.) Loeske  
*Kiaeria glacialis* (Berggr.) I.Hagen  
*Kiaeria starkei*  
*Leptobryum pyriforme* (Hedw.) Wilson  
*Loeskygnum badium* (Hartm.) H.K.G.Paul  
*Drepanocladus badius* (Hartm.) G.Roth  
*Oligotrichum hercynicum* (Hedw.) Lam.& DC.  
*Oligotrichum parallelum* (Mitt.) Kindb.  
*Oncophorus virens*  
*Orthotrichum obtusifolium*  
*Paludella squarrosa* (Hedw.) Brid.  
*Philonotis fontana* (Hedw.) Brid.  
*Philonotis fontana* (Hedw.) Brid.var. *pumila* (Turner) Brid.  
*Philonotis tomentella* Molendo  
*Plagiomnium ellipticum* (Brid.) T.Kop.  
*Plagiomnium rugicum* (Laur.) T.Kop.  
*Plagiomnium medium* (Bruch & Schimp.in Bruch, Schimp.& W.Gümbel) T.Kop.  
*Mnium medium* Bruch & Schimp.in Bruch, Schimp.& W.Gümbel  
*Pleurozium schreberi* (Brid.) Mitt.  
*Pogonatum dentatum* (Brid.) Brid.  
*Pogonatum capillare* (Michx.) Brid.

*Pogonatum urnigerum* (Hedw.) P.Beauv.  
*Pohlia cruda* (Hedw.) Lindb.  
*Pohlia crudoides* (Sull.& Lesq.) Broth.  
*Pohlia drummondii* (Müll.Hal.) A.L.Andrews  
*Pohlia filum* (Schimp.) O.Mårt.  
     *Pohlia gracilis* (Bruch & Schimp.in Bruch, Schimp.& W.Gümbel) Lindb.  
     *Pohlia rothii* (Correns in Limpr.) Broth.  
     *Pohlia schleicheri* H.A.Crum  
*Pohlia ludwigii* (Spreng.ex Schwägr.) Broth.  
*Pohlia nutans* (Hedw.) Lindb.  
     *Pohlia schimperi* (Müll.Hal.) A.L.Andrews in Grout  
*Pohlia prolifera* (Lindb.ex Breidl.) Lindb.ex Arnell  
*Pohlia wahlenbergii* (F.Weber & D.Mohr) A.L.Andrews  
     *Mniobryum albicans* (Wahlenb.) Limpr.  
     *Mniobryum wahlenbergii* (F.Weber & D.Mohr) Jenn.  
     *Pohlia albicans* Lindb.  
*Polytrichastrum alpinum* (Hedw.) G.L.Sm.  
     *Pogonatum alpinum* (Hedw.) Röhl.  
*Polytrichastrum sexangulare* (Brid.) G.L.Sm.var. *sexangulare*  
     *Polytrichum sexangulare* Brid.  
*Polytrichum commune* Hedw.  
*Polytrichum commune* Hedw.var. *commune*  
     *Polytrichum commune* Hedw.var. *perigoniale* (Michx.) Hampe  
*Polytrichum hyperboreum* R.Br.  
*Polytrichum juniperinum* Hedw.  
*Polytrichum piliferum* Hedw.  
*Polytrichum strictum* Brid.  
     *Polytrichum affine* Funck  
     *Polytrichum juniperinum* Hedw.var. *gracilius* Wahlenb.  
*Polytrichum swartzii* Hartm.  
     *Polytrichum algidum* I.Hagen & C.E.O.Jensen  
*Pseudobryum cinclidioides* (Huebener) T.Kop.  
     *Mnium cinclidioides* Huebener  
*Ptilium crista-castrensis* (Hedw.) De Not.  
*Pylaisiella polyantha*  
*Racomitrium affine* (Schleich.ex F.Weber & D.Mohr) Lindb.  
*Racomitrium canescens* (Hedw.) Brid.  
*Racomitrium ericoides* (F.Weber ex Brid.) Brid.  
     *Racomitrium canescens* (Hedw.) Brid.var. *ericoides* (Brid.) Bruch, Schimp.&  
         W.Gümbel  
     *Racomitrium canescens* (Hedw.) Brid.var. *strictum* Schlieph. in Limpr.  
*Racomitrium fasciculare*  
*Racomitrium lanuginosum* (Hedw.) Brid.  
*Rhizomnium andrewsianum* (Steere) T.Kop.  
*Rhizomnium gracile* T.Kop.

*Rhizomnium magnifolium* (Horik.) T.Kop.  
*Mnium punctatum* Hedw.var. *elatum* Schimp.  
*Rhizomnium perssonii* T.Kop.  
*Rhizomnium nudum* (E.Britton & R.S.Williams) T.Kop.  
*Rhizomnium pseudopunctatum* (Bruch & Schimp.) T.Kop.  
*Mnium pseudopunctatum* Bruch & Schimp.  
*Rhytidiadelphus triquetrus* (Hedw.) Warnst.  
*Rhytidium rugosum* (Hedw.) Kindb.  
*Sanionia uncinata* Hedw.  
*Drepanocladus uncinatus* (Hedw.) Warnst.  
*Schistostega pennata* (Hedw.) F.Weber & D.Mohr  
*Sphagnum angustifolium* (C.E.O.Jensen ex Russow) C.E.O.Jensen in Tolf  
*Sphagnum recurvum* P.Beauv.var. *tenu* H.Klinggr.  
*Sphagnum aongstroemii* C.Hartm.  
*Sphagnum capillifolium* (Ehrh.) Hedw.  
*Sphagnum capillaceum* (Weiss) Schrank  
*Sphagnum nemoreum* Scop.auct.plur.  
*Sphagnum centrale* C.E.O.Jensen in Arnell & C.E.O.Jensen  
*Sphagnum fuscum* (Schimp.) H.Klinggr.  
*Sphagnum girgensohnii* Russow  
*Sphagnum lenense* H.Lindb.in Pohle  
*Sphagnum magellanicum* Brid.  
*Sphagnum papillosum* Lindb.  
*Sphagnum recurvum* P.Beauv.  
*Sphagnum recurvum* P.Beauv.var. *recurvum*  
*Sphagnum riparium* Ångstr.  
*Sphagnum russowii* Warnst.  
*Sphagnum robustum* (Warnst.) Röhl  
*Sphagnum squarrosum* Crome  
*Sphagnum subsecundum* Nees in Sturm var. *SUBSECUNDUM*  
*Sphagnum teres* (Schimp.) Ångstr.  
*Tetraphis pellucida* Hedw.  
*Timmia austriaca* Hedw.  
*Tomentypnum nitens* (Hedw.) Loeske  
*Tortella fragilis* (Drumm.) Limpr.  
*Tortula ruralis* (Hedw.) P.Gaertn., B.Mey.& Scherb.  
*Warnstorfia exannulata* (Schimp. in Bruch, Schimp.& W.Gümbel) Loeske  
*Drepanocladus exannulatus* (Schimp. in Bruch, Schimp.& W.Gümbel) Warnst.  
*Warnstorfia trichophylla* (Warnst.) Tuom.& T.Kop.  
*Drepanocladus trichophyllus* (Warnst.) Podp.

# **Appendix G Synopsis of Cryptogam Collections for Fort Richardson Military Reservation, Alaska**

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Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
hepatic	Jungermanniaceae	<i>Anastrophyllum</i> sp.		subalpine	terricolous	mesic	1994	B0027807	
hepatic	Aneuraceae	<i>Aneura pinguis</i>		subalpine	terricolous	mesic	2620	B0028179	
hepatic	Antheliaceae	<i>Anthelia</i> sp.		alpine	saxicolous-terricolous	wet	1668	B0027688	
hepatic	Jungermanniaceae	<i>Barbilophozia kunzeana</i>		lowland	terricolous	wet	2122	B0027865	
hepatic	Jungermanniaceae	<i>Barbilophozia kunzeana</i>		lowland	terricolous	wet	2123	B0027866	
hepatic	Jungermanniaceae	<i>Barbilophozia lycopodioides</i>		alpine	terricolous	mesic	2039	B0027828	
hepatic	Jungermanniaceae	<i>Barbilophozia lycopodioides</i>		subalpine	terricolous	mesic	2061	B0027849	
hepatic	Jungermanniaceae	<i>Barbilophozia quadriloba</i>		lowland	"log, stump, etc"		2288	B0027993	
hepatic	Blasiaceae	<i>Blasia pusilla</i>		lowland	terricolous	mesic	2097	B0027861	
hepatic	Blasiaceae	<i>Blasia pusilla</i>		lowland	terricolous	mesic	2304	B0028002	
hepatic	Blasiaceae	<i>Blasia pusilla</i>		subalpine	terricolous	mesic	2561	B0028172	
hepatic	Pseudolepicleaceae	<i>Blepharostoma trichophyllum</i>		alpine	saxicolous-terricolous		1669	B0027689	
hepatic	Calypogeiaceae	<i>Calypogeia</i> sp.		subalpine	saxicolous-terricolous		2008	B0027818	
hepatic	Cephaloziaceae	<i>Cephalozia ambigua</i>		alpine	terricolous	wet	2512	B0028133	
hepatic	Cephaloziaceae	<i>Cephalozia bicuspidata</i>		lowland	"log, stump, etc"		2291	B0027996	
hepatic	Cephaloziaceae	<i>Cephalozia bicuspidata</i>		lowland	"log, stump, etc"		2395	B0028068	
hepatic	Cephaloziaceae	<i>Cephalozia bicuspidata</i>		subalpine	terricolous		2571	B0028175	
hepatic	Cephaloziellaceae	<i>Cephaloziella</i> sp.		lowland	terricolous	mesic	1862	B0027770	
hepatic	Cephaloziaceae	<i>Cladopodiella</i> sp.		lowland	terricolous	wet	2128	B0027871	
hepatic	Scapaniaceae	<i>Diplophyllum</i> sp.		alpine	saxicolous	mesic	2425	B0028090	
hepatic	Jungermanniaceae	<i>Gymnocolea acutiloba</i>		alpine	saxicolous-terricolous	mesic	1674	B0027694	
hepatic	Gymnomitriaceae	<i>Gymnomitrium obtusum</i>		alpine	saxicolous		2424	B0028089	
hepatic	Jungermanniaceae	<i>Jamesoniella</i> sp.		lowland	terricolous	wet	2198	B0027938	
hepatic	Jungermanniaceae	<i>Jungermannia</i> sp.		subalpine	terricolous	mesic	2523	B0028140	
hepatic	Jungermanniaceae	<i>Jungermannia subelliptica</i>		alpine	terricolous		2469	B0028106	
hepatic	Jungermanniaceae	<i>Lophozia longidens</i>		lowland	"bark, wood"		1749	B0027739	
hepatic	Jungermanniaceae	<i>Lophozia longidens</i>		lowland	"bark, wood"		1762	B0027750	
hepatic	Jungermanniaceae	<i>Lophozia longidens</i>		lowland	"bark, wood"		1817	B0027755	
hepatic	Jungermanniaceae	<i>Lophozia longidens</i>		lowland	terricolous	mesic	2330		
hepatic	Jungermanniaceae	<i>Lophozia ventricosa</i>		lowland	"bark, wood"		1752	B0027742	
hepatic	Marchantiaceae	<i>Marchantia</i> sp.		lowland	terricolous	mesic	2093	B0027857	
hepatic	Gymnomitriaceae	<i>Marsupella</i> sp.		alpine	saxicolous-terricolous		1663	B0027683	
hepatic	Jungermanniaceae	<i>Mylla</i> sp.		lowland	terricolous	wet	2202	B0027942	
hepatic	Jungermanniaceae	<i>Nardia</i> sp.		subalpine	terricolous	mesic	2056	B0027844	



Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
hepatic	Pelliaceae	<i>Pellia neesiana</i>		subalpine	terricolous	mesic	2560	B0028171	
hepatic	Cephaloziaceae	<i>Pleurocladula albescens</i>		alpine	saxicolous-terricolous		1670	B0027690	
hepatic	Cephaloziaceae	<i>Pleurocladula albescens</i>		alpine	terricolous		2482	B0028119	
hepatic	Cephaloziaceae	<i>Pleurocladula albescens</i>		subalpine	terricolous	mesic	2550	B0028164	
hepatic	Ptilidiaceae	<i>Ptilidium californicum</i>		subalpine	"bark, wood"		2567	B0028174	
hepatic	Ptilidiaceae	<i>Ptilidium ciliare</i>		lowland	"log, stump, etc"		2263	B0027980	
hepatic	Ptilidiaceae	<i>Ptilidium ciliare</i>		lowland	terricolous	mesic	2239		
hepatic	Ptilidiaceae	<i>Ptilidium pulcherrimum</i>		lowland	"bark, wood"		1765	B0027751	
hepatic	Ptilidiaceae	<i>Ptilidium pulcherrimum</i>		lowland	"log, stump, etc"		2265	B0027982	
hepatic	Scapaniaceae	<i>Scapania scandica</i>		lowland			2396	B0028069	
lichen	Alectoriaceae	<i>Alectoria nigrigans</i>	common	alpine	terricolous	mesic	1617		
lichen	Alectoriaceae	<i>Alectoria nigrigans</i>	common	alpine	terricolous	mesic	1637	L0014247	
lichen	Alectoriaceae	<i>Alectoria nigrigans</i>	common	subalpine	terricolous	mesic	1932	L0014398	
lichen	Alectoriaceae	<i>Alectoria ochroleuca</i>	common	alpine	saxicolous	mesic	1582	L0014218	
lichen	Alectoriaceae	<i>Alectoria ochroleuca</i>	common	alpine	terricolous	mesic	1571	L0014208	
lichen	Alectoriaceae	<i>Alectoria ochroleuca</i>	common	alpine	terricolous	mesic	1689		
lichen	Alectoriaceae	<i>Alectoria ochroleuca</i>	common	subalpine	terricolous	mesic	1929	L0014395	
lichen	Alectoriaceae	<i>Alectoria ochroleuca</i>	common	subalpine	saxicolous		1967	L0014430	
lichen	Parmeliaceae	<i>Allantoparmelia</i> sp.		subalpine	terricolous	mesic	1936	L0014403	
lichen	Parmeliaceae	<i>Asahinea chrysantha</i>		subalpine	terricolous	mesic	2484	L0014583	
lichen	Parmeliaceae	<i>Asahinea chrysantha</i>		alpine	terricolous	mesic	1593	L0014219	
lichen	Parmeliaceae	<i>Asahinea scholanderi</i>		alpine	saxicolous		2432	L0014558	
lichen	Parmeliaceae	<i>Asahinea scholanderi</i>		alpine	saxicolous		1950	L0014417	
lichen	Bacidiaceae	<i>Bacidia</i> sp.		subalpine	terricolous	mesic			
lichen	Baeomycetaceae	<i>Baeomyces</i> sp.		subalpine	terricolous	dry	2547	L0014605	
lichen	Parmeliaceae	<i>Bryocaulon divergens</i>	common	alpine	terricolous	mesic	1692		
lichen	Parmeliaceae	<i>Bryocaulon divergens</i>	common	subalpine	terricolous	mesic	1933	L0014400	
lichen	Alectoriaceae	<i>Bryoria nitidula</i>	common	subalpine	terricolous	mesic	1930	L0014396	
lichen	Alectoriaceae	<i>Bryoria nitidula</i>	common	subalpine	terricolous	mesic	1931	L0014397	
lichen	Physciaceae	<i>Buellia</i> sp.		alpine	terricolous	mesic	2462	L0014581	
lichen	Caliciaceae	<i>Calicium</i> sp.		lowland	"bark, wood"		1815	L0014320	
lichen	Teloschistaceae	<i>Caloplaca</i> sp.		alpine	saxicolous		2399	L0014547	
lichen	Candelariaceae	<i>Candelariella terrigena</i>		alpine	terricolous	mesic	1578	L0014215	
lichen	Parmeliaceae	<i>Cetraria chlorophylla</i>		lowland	"bark, wood"		1805	L0014311	
lichen	Parmeliaceae	<i>Cetraria chlorophylla</i>		lowland	"bark, wood"		1833	L0014336	

Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
lichen	Parmeliaceae	<i>Cetraria chlorophylla</i>		lowland	"bark, wood"		2076	L0014484	
lichen	Parmeliaceae	<i>Cetraria chlorophylla</i>		lowland	"bark, wood"		2293	L0014530	
lichen	Parmeliaceae	<i>Cetraria hepaticum</i>		subalpine	saxicolous		1969	L0014432	
lichen	Parmeliaceae	<i>Cetraria hepaticum</i>		subalpine	saxicolous		1973	L0014436	
lichen	Parmeliaceae	<i>Cetraria islandica</i>		alpine	saxicolous		1614	L0014233	
lichen	Parmeliaceae	<i>Cetraria islandica</i>		alpine	terricolous	mesic	1684		
lichen	Parmeliaceae	<i>Cetraria islandica</i>		alpine	terricolous	mesic	1685		
lichen	Parmeliaceae	<i>Cetraria islandica</i>		subalpine	terricolous	mesic	1908	L0014376	
lichen	Parmeliaceae	<i>Cetraria islandica</i>		subalpine	terricolous	mesic	1926	L0014392	
lichen	Parmeliaceae	<i>Cetraria islandica</i>		subalpine	terricolous	mesic	1927	L0014393	
lichen	Parmeliaceae	<i>Cetraria islandica</i>		alpine	terricolous	mesic	2035	L0014470	
lichen	Parmeliaceae	<i>Cetraria islandica</i>		subalpine	terricolous	mesic	6168		
lichen	Parmeliaceae	<i>Cetraria kamczatica</i>		alpine	terricolous	mesic	2451	L0014570	
lichen	Parmeliaceae	<i>Cetraria nigricans</i>		alpine	terricolous	mesic	1574	L0014212	
lichen	Parmeliaceae	<i>Cetraria nigricans</i>		alpine	terricolous	mesic	2499	L0014597	
lichen	Parmeliaceae	<i>Cetraria sepincola</i>		lowland	"bark, wood"		1767	L0014274	
lichen	Parmeliaceae	<i>Cetraria sepincola</i>		subalpine	"bark, wood"		1953	L0014420	
lichen	Parmeliaceae	<i>Cetrariella delisei</i>		alpine	terricolous	wet	2513	L0014599	
lichen	Parmeliaceae	<i>Cetrariella fastigiata</i>		alpine	terricolous	wet	2514	L0014600	
lichen	Cladoniaceae	<i>Cladonia aberrans</i>		alpine	saxicolous		1612	L0014231	
lichen	Cladoniaceae	<i>Cladonia aberrans</i>	common	alpine	terricolous	mesic	1569	L0014206	
lichen	Cladoniaceae	<i>Cladonia aberrans</i>		alpine	terricolous	mesic	1636	L0014246	
lichen	Cladoniaceae	<i>Cladonia aberrans</i>	common	subalpine	terricolous	mesic	1916	L0014382	
lichen	Cladoniaceae	<i>Cladonia aberrans</i>		subalpine	terricolous	mesic	1920	L0014387	
lichen	Cladoniaceae	<i>Cladonia aberrans</i>	common	alpine	terricolous	mesic	2452	L0014571	
lichen	Cladoniaceae	<i>Cladonia aberrans</i>	common	alpine	terricolous	mesic	1691		
lichen	Cladoniaceae	<i>Cladonia aberrans</i>	common	subalpine	terricolous	mesic	6170		
lichen	Cladoniaceae	<i>Cladonia arbuscula</i>		lowland	terricolous	mesic	1700	L0014257	
lichen	Cladoniaceae	<i>Cladonia arbuscula</i>		subalpine	terricolous	mesic	2068	L0014476	
lichen	Cladoniaceae	<i>Cladonia mitis</i>		alpine	terricolous	mesic	2457	L0014576	
lichen	Cladoniaceae	<i>Cladonia rangiferina</i>		alpine	saxicolous	mesic	1611	L0014230	
lichen	Cladoniaceae	<i>Cladonia rangiferina</i>		alpine	terricolous	mesic	1572	L0014209	
lichen	Cladoniaceae	<i>Cladonia rangiferina</i>		subalpine	terricolous	mesic	1917	L0014383	
lichen	Cladoniaceae	<i>Cladonia rangiferina</i>		subalpine	terricolous	mesic	1918	L0014384	

Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
lichen	Cladoniaceae	<i>Cladina rangiferina</i>		lowland	terricolous	mesic	2237		
lichen	Cladoniaceae	<i>Cladina rangiferina</i>		subalpine	terricolous	mesic	6169		
lichen	Cladoniaceae	<i>Cladina rangiferina</i>		alpine		mesic	6120	L0014045	
lichen	Cladoniaceae	<i>Cladina stellaris</i>		alpine	terricolous	mesic	2494	L0014592	
lichen	Cladoniaceae	<i>Cladonia acuminata</i>		alpine	terricolous	mesic	2027	L0014462	
lichen	Cladoniaceae	<i>Cladonia amaurocraea</i>		lowland	terricolous	mesic	1858	L0014347	
lichen	Cladoniaceae	<i>Cladonia amaurocraea</i>		lowland	terricolous	mesic	1859	L0014348	
		<i>forma celotea</i>							
lichen	Cladoniaceae	<i>Cladonia bellidiflora</i>		subalpine	terricolous	mesic	1919	L0014385	
lichen	Cladoniaceae	<i>Cladonia bellidiflora</i>		alpine	terricolous	mesic	2421	L0014554	
lichen	Cladoniaceae	<i>Cladonia borealis</i>		alpine	terricolous	mesic	2458	L0014577	
lichen	Cladoniaceae	<i>Cladonia borealis</i>		lowland	terricolous	mesic	1701	L0014258	
lichen	Cladoniaceae	<i>Cladonia borealis</i>		lowland	terricolous	mesic	1887	L0014360	
lichen	Cladoniaceae	<i>Cladonia borealis</i>		alpine	terricolous	mesic	2024	L0014459	
lichen	Cladoniaceae	<i>Cladonia cariosa</i>		lowland	terricolous	mesic	1891	L0014364	
lichen	Cladoniaceae	<i>Cladonia cariosa</i>		alpine	terricolous	mesic	2022	L0014457	
lichen	Cladoniaceae	<i>Cladonia carneola</i>		subalpine	terricolous	mesic	2563	L0014610	
lichen	Cladoniaceae	<i>Cladonia cenotea</i>		lowland	"log, stump, etc"	mesic	1754	L0014269	
lichen	Cladoniaceae	<i>Cladonia cenotea</i>		lowland	"log, stump, etc"	mesic	1846	L0014344	
lichen	Cladoniaceae	<i>Cladonia cenotea</i>		lowland	"log, stump, etc"	mesic	2284	L0014526	
lichen	Cladoniaceae	<i>Cladonia cervicornis</i>		lowland	terricolous	mesic	1704	L0014261	
lichen	Cladoniaceae	<i>Cladonia chlorophaea</i>		lowland	"log, stump, etc"	mesic	1847	L0014345	
lichen	Cladoniaceae	<i>Cladonia chlorophaea</i>		lowland	terricolous	mesic	1889	L0014362	
lichen	Cladoniaceae	<i>Cladonia chlorophaea</i>		alpine	terricolous	mesic	2023	L0014458	
lichen	Cladoniaceae	<i>Cladonia coccifera</i>		alpine	terricolous	mesic	1566	L0014202	
lichen	Cladoniaceae	<i>Cladonia coccifera</i>		lowland	terricolous	mesic	1861	L0014350	
lichen	Cladoniaceae	<i>Cladonia cornuta</i>		lowland	"log, stump, etc"	mesic	2283	L0014525	
lichen	Cladoniaceae	<i>Cladonia cornuta</i>		lowland	terricolous	mesic	1703	L0014260	
lichen	Cladoniaceae	<i>Cladonia cornuta</i>		subalpine	terricolous	mesic	1907	L0014375	
lichen	Cladoniaceae	<i>Cladonia crispata</i>		subalpine	terricolous	mesic	2067	L0014475	
lichen	Cladoniaceae	<i>Cladonia crispata</i>		alpine	terricolous	mesic	2461	L0014580	
lichen	Cladoniaceae	<i>Cladonia crispata</i> var. <i>crispata</i>		alpine	terricolous	mesic	2453	L0014572	
lichen	Cladoniaceae	<i>Cladonia crispata</i> var. <i>crispata</i>		alpine	terricolous	mesic	2455	L0014574	
lichen	Cladoniaceae	<i>Cladonia deformis</i>		lowland	terricolous	mesic	2166	L0014497	

Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
lichen	Cladoniaceae	<i>Cladonia deformis</i>		subalpine	terricolous	mesic	6122	L0014047	
lichen	Cladoniaceae	<i>Cladonia ecmocyna</i>		alpine	terricolous	mesic	2025	L0014460	
lichen	Cladoniaceae	<i>Cladonia ecmocyna</i>							
		subsp. <i>ecmocyna</i>		alpine	saxicolous-terricolous	mesic	2443	L0014567	
lichen	Cladoniaceae	<i>Cladonia ecmocyna</i>							
		subsp. <i>ecmocyna</i>		subalpine	terricolous	mesic	1921	L0014386	
lichen	Cladoniaceae	<i>Cladonia ecmocyna</i>							
		subsp. <i>ecmocyna</i>		alpine	terricolous	mesic	2460	L0014579	
lichen	Cladoniaceae	<i>Cladonia fimbriata</i>		lowland	"log, stump, etc"	mesic	1755	L0014270	
lichen	Cladoniaceae	<i>Cladonia fimbriata</i>		lowland	terricolous	mesic	1888	L0014361	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>gracilis</i>		lowland	terricolous	mesic	1860	L0014349	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>gracilis</i>		subalpine	terricolous	mesic	2065	L0014473	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>turbinata</i>		lowland	"bark, wood"	mesic	2216	L0014501	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>turbinata</i>		lowland	"log, stump, etc"	mesic	1845	L0014343	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>turbinata</i>		lowland	"log, stump, etc"	mesic	2285	L0014527	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>turbinata</i>		lowland	terricolous	mesic	1702	L0014259	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>turbinata</i>		lowland	terricolous	mesic	1890	L0014363	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>turbinata</i>		subalpine	terricolous	mesic	1924	L0014390	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>vulnerata</i>		subalpine	saxicolous-terricolous	mesic	1985	L0014444	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>vulnerata</i>		subalpine	saxicolous-terricolous	mesic	1997	L0014448	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>vulnerata</i>		subalpine	terricolous	mesic	1915	L0014381	
lichen	Cladoniaceae	<i>Cladonia gracilis</i> subsp. <i>vulnerata</i>		subalpine	terricolous	dry	2546	L0014604	
lichen	Cladoniaceae	<i>Cladonia kanewskii</i>		subalpine	terricolous	mesic	1922	L0014388	
lichen	Cladoniaceae	<i>Cladonia kanewskii</i>		alpine	terricolous	wet	2515	L0014601	
lichen	Cladoniaceae	<i>Cladonia kanewskii</i>		alpine	terricolous	wet	2516	L0014602	
lichen	Cladoniaceae	<i>Cladonia ochrochlora</i>		lowland	"bark, wood"	mesic	1763	L0014271	
lichen	Cladoniaceae	<i>Cladonia ochrochlora</i>		lowland	"bark, wood"	mesic	1764	L0014272	
lichen	Cladoniaceae	<i>Cladonia ochrochlora</i>		lowland	"log, stump, etc"	mesic	1744	L0014267	
lichen	Cladoniaceae	<i>Cladonia ochrochlora</i>		lowland	"log, stump, etc"	mesic	2279	L0014523	
lichen	Cladoniaceae	<i>Cladonia ochrochlora</i>		lowland	terricolous	mesic	1883	L0014356	
lichen	Cladoniaceae	<i>Cladonia ochrochlora</i>		lowland	terricolous	mesic	1885	L0014358	
lichen	Cladoniaceae	<i>Cladonia phyllophora</i>		lowland	terricolous	mesic	2271	L0014519	
lichen	Cladoniaceae	<i>Cladonia phyllophora</i>		lowland	terricolous	mesic	6123	L0014048	
lichen	Cladoniaceae	<i>Cladonia pleurota</i>		lowland	"bark, wood"	mesic	2215	L0014500	

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Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
lichen	Cladoniaceae	<i>Cladonia pleurota</i>		subalpine	"bark, wood"	mesic	2565	L0014611	
lichen	Cladoniaceae	<i>Cladonia pleurota</i>		subalpine	terricolous	mesic	6121	L0014046	
lichen	Cladoniaceae	<i>Cladonia pocillum</i>		subalpine	terricolous	wet	1901	L0014370	
lichen	Cladoniaceae	<i>Cladonia pocillum</i>		alpine	terricolous	mesic	2026	L0014461	
lichen	Cladoniaceae	<i>Cladonia pseudostellata</i>		subalpine	terricolous	mesic	2069	L0014477	
lichen	Cladoniaceae	<i>Cladonia pyxidata</i>		lowland	terricolous	mesic	1886	L0014359	
lichen	Cladoniaceae	<i>Cladonia singularis</i>		alpine	terricolous	mesic	2454	L0014573	
lichen	Cladoniaceae	<i>Cladonia singularis</i>		alpine	terricolous	mesic	2459	L0014578	
lichen	Cladoniaceae	<i>Cladonia singularis</i>		alpine	terricolous	mesic	2498	L0014596	
lichen	Cladoniaceae	<i>Cladonia squamosa</i>							
		var. <i>squamosa</i>		lowland	terricolous	mesic	1844	L0014342	
lichen	Cladoniaceae	<i>Cladonia subulata</i>		lowland	terricolous	mesic	1884	L0014357	
lichen	Cladoniaceae	<i>Cladonia sulphurina</i>		subalpine	terricolous	dry	2553	L0014606	
lichen	Cladoniaceae	<i>Cladonia thomsonii</i>		alpine	terricolous	mesic	2488	L0014587	
lichen	Cladoniaceae	<i>Cladonia uncialis</i>		alpine	terricolous	mesic	2456	L0014575	
lichen	Cladoniaceae	<i>Cladonia uncialis</i>		subalpine	terricolous	mesic	6124	L0014049	
lichen	Collemaaceae	<i>Collema</i> sp.		alpine	terricolous	mesic	2402	L0014550	
lichen	Parmeliaceae	<i>Dactylina arctica</i>	common	subalpine	saxicolous-terricolous	mesic	1996	L0014447	
lichen	Parmeliaceae	<i>Dactylina arctica</i>	common	alpine	terricolous	mesic	1596	L0014224	
lichen	Parmeliaceae	<i>Dactylina arctica</i>	common	alpine	terricolous	mesic	1693		
lichen	Parmeliaceae	<i>Dactylina arctica</i>	common	subalpine	terricolous	mesic	1720	L0014399	
lichen	Parmeliaceae	<i>Dactylina arctica</i>	common	alpine	terricolous	mesic	2449	L0014568	
lichen	Parmeliaceae	<i>Dactylina arctica</i>	common	subalpine	terricolous	mesic	6171		
lichen	Parmeliaceae	<i>Dactylina ramulosa</i>		alpine	saxicolous		2439	L0014565	
lichen	Parmeliaceae	<i>Dactylina ramulosa</i>		alpine	terricolous	mesic	1638	L0014248	
lichen	Parmeliaceae	<i>Flavocetraria cucullata</i>		alpine	saxicolous	mesic	1613	L0014232	
lichen	Parmeliaceae	<i>Flavocetraria cucullata</i>		alpine	terricolous	mesic	1616		
lichen	Parmeliaceae	<i>Flavocetraria cucullata</i>		subalpine	terricolous	mesic	2110		
lichen	Parmeliaceae	<i>Flavocetraria cucullata</i>		alpine	terricolous	mesic	2112		
lichen	Parmeliaceae	<i>Flavocetraria nivalis</i>	common	alpine	terricolous	mesic	1570	L0014207	
lichen	Parmeliaceae	<i>Flavocetraria nivalis</i>	common	alpine	terricolous	mesic	1690		
lichen	Parmeliaceae	<i>Flavocetraria nivalis</i>	common	subalpine	terricolous	mesic	1928	L0014394	
lichen	Parmeliaceae	<i>Flavocetraria nivalis</i>	common	lowland	terricolous	mesic	2105		
lichen	Parmeliaceae	<i>Flavocetraria nivalis</i>	common	alpine	terricolous		2113		

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Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.
lichen	Haematommataceae	<i>Ophioparma lapponicum</i>		alpine	saxicolous		1687	
lichen	Haematommataceae	<i>Ophioparma lapponicum</i>		subalpine	saxicolous		2013	L0014451
lichen	Parmeliaceae	<i>Hypogymnia austerodes</i>		lowland	"bark, wood"		1773	L0014280
lichen	Parmeliaceae	<i>Hypogymnia bitteri</i>		lowland	"bark, wood"		1770	L0014277
lichen	Parmeliaceae	<i>Hypogymnia bitteri</i>		lowland	"bark, wood"		1774	L0014281
lichen	Parmeliaceae	<i>Hypogymnia bitteri</i>		lowland	"bark, wood"		1806	L0014312
lichen	Parmeliaceae	<i>Hypogymnia bitteri</i>		lowland	"bark, wood"		1826	L0014329
lichen	Parmeliaceae	<i>Hypogymnia bitteri</i>		subalpine	"bark, wood"		2569	L0014614
lichen	Parmeliaceae	<i>Hypogymnia physodes</i>		lowland	"bark, wood"		1769	L0014276
lichen	Parmeliaceae	<i>Hypogymnia physodes</i>		lowland	"bark, wood"		1771	L0014278
lichen	Parmeliaceae	<i>Hypogymnia physodes</i>		lowland	"bark, wood"		1807	L0014313
lichen	Parmeliaceae	<i>Hypogymnia physodes</i>		lowland	"bark, wood"		1825	L0014328
lichen	Parmeliaceae	<i>Hypogymnia physodes</i>		lowland	"bark, wood"		2320	
lichen	Parmeliaceae	<i>Hypogymnia physodes</i>		subalpine	"bark, wood"		2568	L0014613
lichen	Parmeliaceae	<i>Hypogymnia physodes</i>		lowland	"log, stump, etc"		1745	L0014268
lichen	Parmeliaceae	<i>Hypogymnia subobscura</i>		alpine	saxicolous		2438	L0014564
lichen	Parmeliaceae	<i>Hypogymnia subobscura</i>		alpine	terricolous	mesic	2490	L0014589
lichen	Lecanoraceae	<i>Lecanora</i> sp.		alpine	terricolous	mesic	2401	L0014549
lichen	Collemaaceae	<i>Leptogium</i> sp.		subalpine	saxicolous		2053	L0014471
lichen	Lobariaceae	<i>Lobaria linita</i>		lowland	"bark, wood"		1794	L0014301
lichen	Lobariaceae	<i>Lobaria linita</i>		lowland	"bark, wood"		1797	L0014304
lichen	Lobariaceae	<i>Lobaria linita</i>		subalpine	saxicolous-terricolous		1986	L0014445
lichen	Lobariaceae	<i>Lobaria linita</i>	common	alpine	terricolous	mesic	1633	L0014243
lichen	Lobariaceae	<i>Lobaria linita</i>	common	subalpine	terricolous	mesic	1909	L0014377
lichen	Lobariaceae	<i>Lobaria linita</i>	common	alpine	terricolous	mesic	2029	L0014464
lichen	Lobariaceae	<i>Lobaria linita</i>	common	subalpine	terricolous	mesic	6172	
lichen	Lobariaceae	<i>Lobaria pulmonaria</i>		lowland	"bark, wood"		1796	L0014303
lichen	Lobariaceae	<i>Lobaria pulmonaria</i>		lowland	"bark, wood"		1819	L0014322
lichen	Lobariaceae	<i>Lobaria pulmonaria</i>		lowland	"bark, wood"		1824	L0014327
lichen	Lobariaceae	<i>Lobaria pulmonaria</i>		lowland	"bark, wood"		2321	
lichen	Lobariaceae	<i>Lobaria scrobiculata</i>		lowland	"bark, wood"		1795	L0014302
lichen	Lobariaceae	<i>Lobaria scrobiculata</i>		lowland	"bark, wood"		2294	L0014531
lichen	Lobariaceae	<i>Lobaria scrobiculata</i>		lowland	"log, stump, etc"		2083	L0014489
lichen	Ectolchiaceae	<i>Lopadium pezizoideum</i>		subalpine	saxicolous		2577	L0014621

Synopsis of Cryptogam Collections for Fort Richardson, AK													
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.					
lichen	Ectolechiaceae	<i>Lopadium pezizoideum</i>	common	subalpine	terricolous	mesic	1941	L0014408					
lichen	Parmeliaceae	<i>Melanella</i> sp.		lowland	"bark, wood"		1775	L0014282					
lichen	Nephromataceae	<i>Nephroma arcticum</i>	common	alpine	terricolous	mesic	1635	L0014245					
lichen	Nephromataceae	<i>Nephroma arcticum</i>	common	subalpine	terricolous	mesic	1925	L0014391					
lichen	Nephromataceae	<i>Nephroma arcticum</i>	common	lowland	terricolous	mesic	2217	L0014502					
lichen	Nephromataceae	<i>Nephroma arcticum</i>	common	alpine	terricolous	mesic	2487	L0014586					
lichen	Nephromataceae	<i>Nephroma bellum</i>		lowland	"bark, wood"		1799	L0014306					
lichen	Nephromataceae	<i>Nephroma expallidum</i>		alpine	terricolous	mesic	1632	L0014242					
lichen	Nephromataceae	<i>Nephroma expallidum</i>		subalpine	terricolous	mesic	1910	L0014378					
lichen	Nephromataceae	<i>Nephroma expallidum</i>		subalpine	terricolous	mesic	2064	L0014472					
lichen	Nephromataceae	<i>Nephroma parile</i>		lowland	"bark, wood"		1800	L0014307					
lichen	Nephromataceae	<i>Nephroma parile</i>		lowland	"bark, wood"		1801	L0014308					
lichen	Nephromataceae	<i>Nephroma parile</i>		lowland	"log, stump, etc"		2085	L0014491					
lichen	Nephromataceae	<i>Nephroma</i> sp.		subalpine	saxicolous		2578	L0014622					
lichen	Ochrolechiaceae	<i>Ochrolechia frigida</i>	common	alpine	terricolous	mesic	1577	L0014214					
lichen	Pertusariaceae	<i>Ochrolechia frigida</i>	common	subalpine	terricolous	mesic	1945	L0014412					
lichen	Pannariaceae	<i>Pannaria pezizoides</i>		alpine	saxicolous		2441	L0014566					
lichen	Pannariaceae	<i>Pannaria pezizoides</i>		alpine	terricolous	mesic	2497	L0014595					
lichen	Parmeliaceae	<i>Parmelia hygrophila</i>		lowland	"bark, wood"		1782	L0014289					
lichen	Parmeliaceae	<i>Parmelia omphalodes</i>		alpine	saxicolous		1592	L0014223					
lichen	Parmeliaceae	<i>Parmelia omphalodes</i>		alpine	saxicolous		1595	L0014221					
lichen	Parmeliaceae	<i>Parmelia omphalodes</i>		alpine	saxicolous		2433	L0014559					
lichen	Parmeliaceae	<i>Parmelia omphalodes</i>		subalpine	saxicolous-terricolous		1980	L0014443					
lichen	Parmeliaceae	<i>Parmelia omphalodes</i>		subalpine	terricolous	mesic	1947	L0014414					
lichen	Parmeliaceae	<i>Parmelia saxatilis</i>		subalpine	saxicolous		2579	L0014623					
lichen	Parmeliaceae	<i>Parmelia squarrosa</i>		lowland	"bark, wood"		1810	L0014316					
lichen	Parmeliaceae	<i>Parmelia stygia</i>		alpine	saxicolous		2437	L0014563					
lichen	Parmeliaceae	<i>Parmelia sulcata</i>		lowland	"bark, wood"		1780	L0014287					
lichen	Parmeliaceae	<i>Parmelia sulcata</i>		lowland	"bark, wood"		1781	L0014288					
lichen	Parmeliaceae	<i>Parmelia sulcata</i>		lowland	"bark, wood"		1783	L0014290					
lichen	Parmeliaceae	<i>Parmelia sulcata</i>		lowland	"bark, wood"		1809	L0014315					
lichen	Parmeliaceae	<i>Parmelia sulcata</i>		lowland	"bark, wood"		1831	L0014334					
lichen	Parmeliaceae	<i>Parmelia sulcata</i>		lowland	"bark, wood"		1832	L0014335					
lichen	Parmeliaceae	<i>Parmelia sulcata</i>		lowland	"bark, wood"		2104						

## Synopsis of Cryptogam Collections for Fort Richardson, AK

Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.
lichen	Parmeliaceae	<i>Parmeliopsis ambigua</i>		lowland	"bark, wood"		1811	L0014317
lichen	Parmeliaceae	<i>Parmeliopsis ambigua</i>		subalpine	"bark, wood"		2570	L0014615
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	lowland	"log, stump, etc"	mesic	1857	L0014346
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	lowland	terricolous	mesic	1728	L0014263
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	lowland	terricolous	mesic	1734	L0014266
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	lowland	terricolous	mesic	1896	L0014369
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	subalpine	terricolous	mesic	1911	L0014379
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	alpine	terricolous	mesic	2019	L0014454
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	lowland	terricolous	mesic	2220	L0014503
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	lowland	terricolous	mesic	2221	L0014504
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	lowland	terricolous	mesic	2319	
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	lowland	terricolous	mesic	2834	L0014848
lichen	Peltigeraceae	<i>Peltigera aphthosa</i>	common	subalpine	terricolous	mesic	6173	
lichen	Peltigeraceae	<i>Peltigera canina</i>	common	lowland	"bark, wood"		2322	
lichen	Peltigeraceae	<i>Peltigera canina</i>	common	lowland	"log, stump, etc"		2297	L0014533
lichen	Peltigeraceae	<i>Peltigera canina</i>	common	lowland	terricolous	mesic	1733	L0014265
lichen	Peltigeraceae	<i>Peltigera canina</i>	common	subalpine	terricolous	mesic	2109	
lichen	Peltigeraceae	<i>Peltigera canina</i>	common	subalpine	terricolous	mesic	2111	
lichen	Peltigeraceae	<i>Peltigera canina</i>	common	lowland	terricolous	dry	2380	L0014537
lichen	Peltigeraceae	<i>Peltigera canina</i>	common	lowland	terricolous	mesic	2839	L0014847
lichen	Peltigeraceae	<i>Peltigera didactyla</i>	common	lowland	"log, stump, etc"		2086	L0014492
lichen	Peltigeraceae	<i>Peltigera didactyla</i>	common	lowland	terricolous	mesic	1729	L0014264
lichen	Peltigeraceae	<i>Peltigera didactyla</i>	common	lowland	terricolous	mesic	2299	L0014535
lichen	Peltigeraceae	<i>Peltigera didactyla</i>	common	lowland	terricolous	dry	2383	L0014540
lichen	Peltigeraceae	<i>Peltigera didactyla</i>	common	subalpine	terricolous		6174	
lichen	Peltigeraceae	<i>Peltigera horizontalis</i>		lowland	terricolous	mesic	2836	L0014846
lichen	Peltigeraceae	<i>Peltigera lepidophora</i>		lowland	terricolous	dry	2384	L0014541
lichen	Peltigeraceae	<i>Peltigera leucophlebia</i>	common	lowland	terricolous	mesic	1705	L0014262
lichen	Peltigeraceae	<i>Peltigera leucophlebia</i>	common	lowland	terricolous	mesic	1894	L0014367
lichen	Peltigeraceae	<i>Peltigera leucophlebia</i>	common	lowland	terricolous	mesic	2273	L0014521
lichen	Peltigeraceae	<i>Peltigera leucophlebia</i>	common	lowland	terricolous	dry	2392	L0014546
lichen	Peltigeraceae	<i>Peltigera malacea</i>		subalpine	terricolous	mesic	1912	L0014380
lichen	Peltigeraceae	<i>Peltigera membranacea</i>		lowland	"bark, wood"		2257	L0014516
lichen	Peltigeraceae	<i>Peltigera membranacea</i>		lowland	"log, stump, etc"		1843	L0014341



Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
lichen	Peltigeraceae	<i>Peltigera membranacea</i>	common	lowland	terricolous	mesic	2087	L0014493	
lichen	Peltigeraceae	<i>Peltigera membranacea</i>	common	lowland	terricolous	mesic	2222	L0014505	
lichen	Peltigeraceae	<i>Peltigera praetextata</i>		lowland	terricolous	dry	2385	L0014542	
lichen	Peltigeraceae	<i>Peltigera rufescens</i>	common	alpine	saxicolous		1644	L0014254	
lichen	Peltigeraceae	<i>Peltigera rufescens</i>	common	alpine	terricolous	mesic	1565	L0014201	
lichen	Peltigeraceae	<i>Peltigera rufescens</i>	common	lowland	terricolous	mesic	1892	L0014365	
lichen	Peltigeraceae	<i>Peltigera rufescens</i>	common	lowland	terricolous	mesic	1893	L0014366	
lichen	Peltigeraceae	<i>Peltigera rufescens</i>	common	lowland	terricolous	mesic	2272	L0014520	
lichen	Peltigeraceae	<i>Peltigera rufescens</i>	common	lowland	terricolous	dry	2381	L0014538	
lichen	Peltigeraceae	<i>Peltigera rufescens</i>	common	lowland	terricolous	dry	2382	L0014539	
lichen	Peltigeraceae	<i>Peltigera scabrosa</i>		lowland	terricolous	mesic	2167	L0014498	
lichen	Peltigeraceae	<i>Peltigera scabrosa</i>		alpine	terricolous	mesic	2450	L0014569	
lichen	Peltigeraceae	<i>Peltigera scabrosa</i>		subalpine	terricolous	mesic	6175		
lichen	Pertusariaceae	<i>Pertusaria</i> sp.		subalpine	"bark, wood"		2566	L0014612	
lichen	Physciaceae	<i>Physcia dubia</i>		subalpine	"bark, wood"		1784	L0014291	
lichen	Parmeliaceae	<i>Platismatia glauca</i>		lowland	"bark, wood"		1823	L0014326	
lichen	Parmeliaceae	<i>Pseudephebe pubescens</i>		lowland	"bark, wood"		1591	L0014222	
lichen	Parmeliaceae	<i>Pseudephebe</i> sp.		alpine	saxicolous		1978	L0014441	
lichen	Lobariaceae	<i>Pseudocyphellaria crocata</i>		subalpine	saxicolous		2082	L0014488	
lichen	Pannariaceae	<i>Psoroma hypnorum</i>		lowland	"bark, wood"		2004	L0014449	
lichen	Pannariaceae	<i>Psoroma hypnorum</i>	common	subalpine	"bark, wood"		1686		
lichen	Pannariaceae	<i>Psoroma hypnorum</i>	common	alpine	terricolous		1902	L0014371	
lichen	Pannariaceae	<i>Psoroma hypnorum</i>	common	subalpine	terricolous	mesic	1991	L0014446	
lichen	Pannariaceae	<i>Psoroma hypnorum</i>	common	subalpine	terricolous	mesic	2028	L0014463	
lichen	Pannariaceae	<i>Psoroma hypnorum</i>	common	alpine	terricolous		2557	L0014608	
lichen	Pannariaceae	<i>Psoroma hypnorum</i>	common	subalpine	terricolous	mesic	1786	L0014293	
lichen	Ramalinaceae	<i>Ramalina</i> sp.		lowland	"bark, wood"		1834	L0014337	
lichen	Ramalinaceae	<i>Ramalina thrausta</i>		lowland	"bark, wood"		1688		
lichen	Rhizocarpaceae	<i>Rhizocarpon geographicum</i>		alpine	saxicolous		1961	L0014424	
lichen	Rhizocarpaceae	<i>Rhizocarpon geographicum</i>		subalpine	saxicolous		1949	L0014416	
lichen	Physciaceae	<i>Rinodina</i> sp.		subalpine	terricolous	mesic	1558	L0014200	
lichen	Peltigeraceae	<i>Solorina crocea</i>	common	alpine	terricolous	wet	1634	L0014244	
lichen	Peltigeraceae	<i>Solorina crocea</i>	common	alpine	terricolous		2070	L0014478	
lichen	Peltigeraceae	<i>Solorina crocea</i>	common	subalpine	terricolous	mesic	6176		

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Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.
lichen	Sphaerophoraceae	<i>Sphaerophorus fragilis</i>		alpine	saxicolous		1594	L0014220
lichen	Sphaerophoraceae	<i>Sphaerophorus fragilis</i>		subalpine	saxicolous		1959	L0014422
lichen	Sphaerophoraceae	<i>Sphaerophorus fragilis</i>		subalpine	terricolous	mesic	1939	L0014406
lichen	Sphaerophoraceae	<i>Sphaerophorus fragilis</i>		subalpine	terricolous	mesic	1979	L0014442
lichen	Sphaerophoraceae	<i>Sphaerophorus globosus</i>	common	alpine	terricolous	mesic	1581	L0014217
lichen	Sphaerophoraceae	<i>Sphaerophorus globosus</i>	common	alpine	terricolous	mesic	1694	
lichen	Sphaerophoraceae	<i>Sphaerophorus globosus</i>	common	subalpine	terricolous	mesic	1940	L0014407
lichen	Sphaerophoraceae	<i>Sphaerophorus globosus</i>	common	alpine	terricolous	mesic	2463	L0014582
lichen	Sphaerophoraceae	<i>Sphaerophorus globosus</i>	common	alpine	terricolous	mesic	2489	L0014588
lichen	Stereocaulaceae	<i>Stereocaulon alpinum</i>	common	subalpine	terricolous	mesic	1904	L0014372
lichen	Stereocaulaceae	<i>Stereocaulon alpinum</i>	common	alpine	terricolous	mesic	2031	L0014466
lichen	Stereocaulaceae	<i>Stereocaulon arenarium</i>	common	alpine	terricolous	mesic	1567	L0014204
lichen	Stereocaulaceae	<i>Stereocaulon arenarium</i>	common	alpine	terricolous	mesic	1579	L0014203
lichen	Stereocaulaceae	<i>Stereocaulon arenarium</i>	common	alpine	terricolous	mesic	2500	L0014598
lichen	Stereocaulaceae	<i>Stereocaulon glareosum</i>	common	alpine	terricolous	mesic	2032	L0014467
lichen	Stereocaulaceae	<i>Stereocaulon glareosum</i>						
lichen	Stereocaulaceae	var. <i>brachyphylloides</i>	common	alpine	terricolous	mesic	1681	L0014255
lichen	Stereocaulaceae	<i>Stereocaulon glareosum</i>						
lichen	Stereocaulaceae	var. <i>glareosum</i>	common	alpine	terricolous	mesic	2030	L0014465
lichen	Stereocaulaceae	<i>Stereocaulon grande</i>		alpine	terricolous	mesic	2485	L0014584
lichen	Stereocaulaceae	<i>Stereocaulon groenlandicum</i>		subalpine	terricolous	mesic	1905	L0014373
lichen	Stereocaulaceae	<i>Stereocaulon groenlandicum</i>		alpine	terricolous	mesic	2414	L0014553
lichen	Stereocaulaceae	<i>Stereocaulon groenlandicum</i>		alpine	terricolous	mesic	2492	L0014591
lichen	Stereocaulaceae	<i>Stereocaulon paschale</i>	common	alpine	terricolous	mesic	1568	L0014205
lichen	Stereocaulaceae	<i>Stereocaulon paschale</i>	common	lowland	terricolous	mesic	1699	L0014256
lichen	Stereocaulaceae	<i>Stereocaulon paschale</i>	common	subalpine	terricolous	mesic	1935	L0014402
lichen	Stereocaulaceae	<i>Stereocaulon paschale</i>	common	alpine	terricolous	mesic	2491	L0014590
lichen	Stereocaulaceae	<i>Stereocaulon rivulorum</i>	common	alpine	terricolous	mesic	2033	L0014468
lichen	Stereocaulaceae	<i>Stereocaulon tomentosum</i>		lowland	terricolous	mesic	1895	L0014368
lichen	Unknown lichen	<i>Thamnolia vermicularis</i>		alpine	terricolous	mesic	1580	L0014216
lichen	Unknown lichen	<i>Thamnolia vermicularis</i>		subalpine	terricolous	mesic	1937	L0014404
lichen	Unknown lichen	<i>Thamnolia subuliformis</i>		subalpine	terricolous	mesic	1938	L0014405
lichen	Bacidiaceae	<i>Toninia</i> sp.		alpine	saxicolous		1619	L0014236
lichen	Umbilicariaceae	<i>Umbilicaria proboscidea</i>		alpine	saxicolous		1597	L0014225

Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
lichen	Umbilicariaceae	<i>Umbilicaria proboscidea</i>		subalpine	saxicolous		1974	L0014437	
lichen	Umbilicariaceae	<i>Umbilicaria rigida</i>		alpine	saxicolous		1599	L0014227	
lichen	Parmeliaceae	<i>Usnea</i> sp.		lowland	"bark, wood"		1791	L0014298	
lichen	Parmeliaceae	<i>Vulpicida pinastri</i>		lowland	"bark, wood"		2101		
lichen	Parmeliaceae	<i>Vulpicida pinastri</i>		lowland	"bark, wood"		1792	L0014299	
lichen	Parmeliaceae	<i>Vulpicida pinastri</i>		lowland	"bark, wood"		1812	L0014318	
lichen	Parmeliaceae	<i>Vulpicida tilesii</i>		alpine	terricolous	mesic	2400	L0014548	
lichen	Teloschistaceae	<i>Xanthoria candelaria</i>		lowland	"bark, wood"		1866	L0014351	
moss	Thuidiaceae	<i>Abietinella abietina</i>		lowland	saxicolous	mesic	2364	B0028048	
moss	Thuidiaceae	<i>Abietinella abietina</i>		lowland	terricolous	mesic	2102		
moss	Thuidiaceae	<i>Abietinella abietina</i>		lowland	terricolous	mesic	2103		
moss	Amblystegiaceae	<i>Amblystegium</i> sp.		lowland	"bark, wood"		1864	B0027772	
moss	Andreaeaceae	<i>Andreaea blyttii</i>		alpine	saxicolous		2405	B0028073	
moss	Andreaeaceae	<i>Andreaea nivalis</i>		alpine	saxicolous		2521	B0028138	
moss	Andreaeaceae	<i>Andreaea rupestris</i>		alpine	saxicolous		2440	B0028094	
moss	Andreaeaceae	<i>Andreaea rupestris</i> var. <i>rupestris</i>		alpine	saxicolous		1602	B0027649	
moss	Andreaeaceae	<i>Andreaea rupestris</i> var. <i>rupestris</i>		alpine	saxicolous		1645	B0027665	
moss	Andreaeaceae	<i>Andreaea rupestris</i> var. <i>rupestris</i>		subalpine	saxicolous		2016	B0027824	
moss	Andreaeaceae	<i>Andreaea rupestris</i> var. <i>rupestris</i>		subalpine	saxicolous		2055	B0027843	
moss	Andreaeaceae	<i>Andreaea rupestris</i> var. <i>rupestris</i>		alpine	saxicolous		2406	B0028074	
moss	Andreaeaceae	<i>Andreaea rupestris</i> var. <i>rupestris</i>		alpine	saxicolous		2422	B0028087	
moss	Andreaeaceae	<i>Andreaea rupestris</i> var. <i>rupestris</i>		subalpine	saxicolous		2583	B0028176	
moss	Aulacomniaceae	<i>Aulacomnium androgynum</i>		lowland	terricolous	wet	2214	B0027954	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	lowland	terricolous	mesic	1716	B0027713	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	alpine	terricolous		2040	B0027829	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	subalpine	terricolous	mesic	2107		
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	lowland	terricolous	wet	2130	B0027873	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	lowland	terricolous	wet	2131	B0027874	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	lowland	terricolous	wet	2205	B0027945	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	lowland	terricolous	wet	2213	B0027953	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	lowland	terricolous	mesic	2270	B0027985	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	lowland	terricolous	wet	2308	B0028006	
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	lowland	terricolous	mesic	2323		
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	subalpine	terricolous	mesic	2524	B0028141	

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Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.
moss	Aulacomniaceae	<i>Aulacomnium palustre</i>	common	subalpine	terricolous	mesic	2556	B0028168
moss	Pottiaceae	<i>Barbula</i> sp.		alpine	terricolous		2046	B0027835
moss	Bartramiaceae	<i>Bartramia ithyphylla</i>		alpine	saxicolous		1605	B0027652
moss	Bartramiaceae	<i>Bartramia ithyphylla</i>		subalpine	terricolous	mesic	2010	B0027820
moss	Bartramiaceae	<i>Bartramia ithyphylla</i>		alpine	terricolous		2471	B0028108
moss	Brachytheciaceae	<i>Brachythecium</i> sp.		lowland	"bark, wood"		1759	B0027752
moss	Brachytheciaceae	<i>Brachythecium turgidum</i>		subalpine	terricolous	mesic	1554	B0027632
moss	Brachytheciaceae	<i>Brachythecium turgidum</i>		alpine	terricolous	mesic	1680	B0027700
moss	Pottiaceae	<i>Bryoerythrophyllum recurvirostre</i> var. <i>recurvirostre</i>						
moss	Bryaceae	<i>Bryum</i> sp.		lowland	saxicolous		2366	B0028050
moss	Bryaceae	<i>Bryum caespitium</i>		lowland	saxicolous		2342	B0028026
moss	Bryaceae	<i>Bryum caespitium</i>		subalpine	terricolous	mesic	1555	B0027631
moss	Bryaceae	<i>Bryum pseudotriquetrum</i>		lowland	terricolous	mesic	1878	B0027781
moss	Bryaceae	<i>Bryum pseudotriquetrum</i>		alpine	terricolous	wet	2505	B0028126
moss	Buxbaumiaceae	<i>Buxbaumia aphylla</i>		subalpine	terricolous	dry	2548	B0028162
moss	Amblystegiaceae	<i>Calliergon cordifolium</i>		lowland	terricolous	wet	2207	B0027947
moss	Amblystegiaceae	<i>Calliergon cordifolium</i>		lowland	terricolous	wet	2208	B0027948
moss	Amblystegiaceae	<i>Calliergon cordifolium</i>		lowland	terricolous	wet	2245	B0027963
moss	Amblystegiaceae	<i>Calliergon cordifolium</i>		lowland	terricolous	wet	2246	B0027964
moss	Amblystegiaceae	<i>Calliergon cordifolium</i>		lowland	terricolous	wet	2352	B0028036
moss	Amblystegiaceae	<i>Calliergon richardsonii</i>		lowland	terricolous	wet	2242	B0027960
moss	Amblystegiaceae	<i>Calliergon richardsonii</i>		lowland	terricolous	wet	2243	B0027961
moss	Amblystegiaceae	<i>Calliergon stramineum</i>	common	lowland	terricolous	wet	2132	B0027875
moss	Amblystegiaceae	<i>Calliergon stramineum</i>	common	lowland	terricolous	wet	2133	B0027876
moss	Amblystegiaceae	<i>Calliergon stramineum</i>	common	lowland	terricolous	wet	2134	B0027877
moss	Amblystegiaceae	<i>Calliergon stramineum</i>		lowland	terricolous	wet	2244	B0027962
moss	Amblystegiaceae	<i>Campylium</i> sp.		lowland	terricolous	mesic	1879	B0027782
moss	Ditrichaceae	<i>Ceratodon purpureus</i>	common	alpine	terricolous	mesic	1695	
moss	Ditrichaceae	<i>Ceratodon purpureus</i>	common	lowland	terricolous	mesic	1710	B0027707
moss	Ditrichaceae	<i>Ceratodon purpureus</i>	common	lowland	terricolous	mesic	1721	B0027717
moss	Ditrichaceae	<i>Ceratodon purpureus</i>	common	lowland	terricolous	mesic	1881	B0027784
moss	Ditrichaceae	<i>Ceratodon purpureus</i>	common	lowland	terricolous	mesic	2114	
moss	Ditrichaceae	<i>Ceratodon purpureus</i>	common	lowland	terricolous	mesic	2324	
moss	Ditrichaceae	<i>Ceratodon purpureus</i>	common	alpine	terricolous	mesic	2477	B0028114

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Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
moss	Climaciaceae	<i>Climacium dendroides</i>		lowland	terricolous	wet	1875	B0027778	
moss	Bartramiaceae	<i>Conostomum tetragonum</i>		alpine	terricolous	wet-mesic	1696		
moss	Bartramiaceae	<i>Conostomum tetragonum</i>		alpine	terricolous	wet-mesic	2478	B0028115	
moss	Amblystegiaceae	<i>Cratoneuron filicinum</i>		lowland	saxicolous		2337	B0028021	
moss	Pottiaceae	<i>Desmatodon</i> sp.		subalpine	terricolous	mesic	2059	B0027847	
moss	Dicranaceae	<i>Dichodontium</i> sp.		lowland	saxicolous		2333	B0028017	
moss	Dicranaceae	<i>Dicranella</i> sp.		lowland	"bark, wood"		1756	B0027744	
moss	Dicranaceae	<i>Dicranella schreberiana</i>		lowland	saxicolous		2372	B0028056	
moss	Dicranaceae	<i>Dicranoweisia crispula</i>		alpine	saxicolous		1610	B0027657	
moss	Dicranaceae	<i>Dicranoweisia crispula</i>		subalpine	saxicolous		2015	B0027823	
moss	Dicranaceae	<i>Dicranoweisia crispula</i>		alpine	saxicolous-terricolous		1658	B0027678	
moss	Dicranaceae	<i>Dicranum brevifolium</i>		subalpine	terricolous	mesic	2062	B0027850	
moss	Dicranaceae	<i>Dicranum elongatum</i>		alpine	terricolous	mesic	1583	B0027641	
moss	Dicranaceae	<i>Dicranum majus</i>	common	alpine	saxicolous-terricolous	mesic	1651	B0027671	
moss	Dicranaceae	<i>Dicranum majus</i>	common	alpine	saxicolous-terricolous	mesic	1653	B0027673	
moss	Dicranaceae	<i>Dicranum polysetum</i>	common	subalpine	terricolous	mesic	1955	B0027794	
moss	Dicranaceae	<i>Dicranum polysetum</i>	common	lowland	terricolous	mesic	2278	B0027989	
moss	Dicranaceae	<i>Dicranum scoparium</i>	common	lowland	"log, stump, etc"	mesic	1746	B0027736	
moss	Dicranaceae	<i>Dicranum scoparium</i>	common	lowland	terricolous	mesic	1717	B0027714	
moss	Dicranaceae	<i>Dicranum scoparium</i>	common	lowland	terricolous	mesic	1840	B0027758	
moss	Dicranaceae	<i>Dicranum scoparium</i>	common	subalpine	terricolous	mesic	1954	B0027793	
moss	Dicranaceae	<i>Dicranum scoparium</i>	common	subalpine	terricolous	mesic	2558	B0028169	
moss	Pottiaceae	<i>Didymodon</i> sp.		lowland	saxicolous		2363	B0028047	
moss	Ditrichaceae	<i>Distichium capillaceum</i>		alpine	saxicolous-terricolous	mesic	1660	B0027680	
moss	Ditrichaceae	<i>Ditrichum flexicaule</i>		lowland	saxicolous		2365	B0028049	
moss	Amblystegiaceae	<i>Drepanocladus aduncus</i>		lowland	terricolous	wet	2309	B0028007	
moss	Amblystegiaceae	<i>Drepanocladus badius</i>		lowland	terricolous	wet	2137	B0027880	
moss	Amblystegiaceae	<i>Drepanocladus exannulatus</i>		lowland	terricolous	wet	2250	2419956	
moss	Amblystegiaceae	<i>Drepanocladus exannulatus</i>		lowland	terricolous	wet	2251	B0027969	
moss	Amblystegiaceae	<i>Drepanocladus</i> sp.		lowland	"bark, wood"		1719	B0027716	
moss	Amblystegiaceae	<i>Drepanocladus trichophyllus</i>		lowland	terricolous	wet	2135	B0027878	
moss	Amblystegiaceae	<i>Drepanocladus trichophyllus</i>		lowland	terricolous	wet	2136	B0027879	
moss	Encalyptaceae	<i>Encalypta brevicolla</i>							
		var. <i>brevicolla</i>		alpine	terricolous	mesic	1585	B0027643	

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Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.
moss	Encalyptaceae	<i>Encalypta brevipes</i>		alpine	terricolous	mesic	1584	B0027642
moss	Encalyptaceae	<i>Encalypta procera</i>		lowland	saxicolous	mesic	2371	B0028055
moss	Encalyptaceae	<i>Encalypta rhaptocarpa</i>		alpine	terricolous	mesic	1586	B0027644
moss	Encalyptaceae	<i>Encalypta rhaptocarpa</i>		subalpine	terricolous	mesic	1956	B0027795
moss	Brachytheciaceae	<i>Eurhynchium pulchellum</i>		lowland	terricolous	mesic	1873	B0027776
moss	Grimmiaceae	<i>Grimmia</i> sp.		alpine	saxicolous		1603	B0027650
moss	Pottiaceae	<i>Gymnostomum</i> sp.		lowland	saxicolous		2388	B0028063
moss	Helodiaceae	<i>Helodium</i> sp.		lowland	terricolous	wet	2249	B0027967
moss	Amblystegiaceae	<i>Hygrohypnum</i> sp.		lowland	saxicolous		2338	B0028022
moss	Hylocomiaceae	<i>Hylocomium pyrenaicum</i>		alpine	saxicolous-terricolous		1649	B0027669
moss	Hylocomiaceae	<i>Hylocomium splendens</i>	common	alpine	saxicolous-terricolous		1650	B0027670
moss	Hylocomiaceae	<i>Hylocomium splendens</i>	common	lowland	terricolous	mesic	1714	B0027711
moss	Hylocomiaceae	<i>Hylocomium splendens</i>	common	lowland	terricolous	mesic	1736	B0027728
moss	Hylocomiaceae	<i>Hylocomium splendens</i>	common	subalpine	terricolous	mesic	1900	B0027789
moss	Hylocomiaceae	<i>Hylocomium splendens</i>	common	lowland	terricolous	mesic	2115	
moss	Hylocomiaceae	<i>Hylocomium splendens</i>	common	lowland	terricolous	mesic	2276	B0027987
moss	Hylocomiaceae	<i>Hylocomium splendens</i>	common	lowland	terricolous	mesic	2325	
moss	Hypnaceae	<i>Hypnum revolutum</i>		alpine	saxicolous		1609	B0027656
moss	Dicranaceae	<i>Kiaeria blyttii</i>		alpine	terricolous		2466	B0028103
moss	Dicranaceae	<i>Kiaeria glacialis</i>		alpine	terricolous		2483	B0028120
moss	Dicranaceae	<i>Kiaeria</i> sp.		alpine	terricolous	wet	2503	B0028124
moss	Dicranaceae	<i>Kiaeria starkei</i>		alpine	saxicolous		2520	2419953
moss	Bryaceae	<i>Leptobryum pyriforme</i>		lowland	terricolous	mesic	1852	B0027765
moss	Bryaceae	<i>Leptobryum pyriforme</i>		lowland	terricolous	wet	2313	B0028011
moss	Bryaceae	<i>Leptobryum pyriforme</i>		lowland	wood		2255	B0027973
moss	Mniaceae	<i>Mnium</i> sp.		lowland	"log, stump, etc"		2095	B0027859
moss	Neckeraceae	<i>Neckera</i> sp.		lowland	"bark, wood"		2079	B0027853
moss	Polytrichaceae	<i>Oligotrichum hercynicum</i>		alpine	terricolous		2473	B0028110
moss	Polytrichaceae	<i>Oligotrichum hercynicum</i>		subalpine	terricolous	mesic	2526	B0028143
moss	Polytrichaceae	<i>Oligotrichum hercynicum</i>		subalpine	terricolous	mesic	2527	B0028144
moss	Polytrichaceae	<i>Oligotrichum hercynicum</i>		subalpine	terricolous	mesic	2528	B0028145
moss	Polytrichaceae	<i>Oligotrichum hercynicum</i>		subalpine	terricolous	mesic	2529	B0028146
moss	Polytrichaceae	<i>Oligotrichum parallelum</i>		alpine	terricolous	mesic	2474	B0028111
moss	Polytrichaceae	<i>Oligotrichum parallelum</i>		subalpine	terricolous	mesic	2530	B0028147

Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
moss	Polytrichaceae	<i>Oligotrichum parallelum</i>		subalpine	terricolous	mesic	2531	B0028148	
moss	Polytrichaceae	<i>Oligotrichum parallelum</i>		subalpine	terricolous	mesic	2532	B0028149	
moss	Polytrichaceae	<i>Oligotrichum parallelum</i>		subalpine	terricolous	mesic	2533	B0028150	
moss	Polytrichaceae	<i>Oligotrichum parallelum</i>		subalpine	terricolous	mesic	2534	B0028151	
moss	Dicranaceae	<i>Oncophorus</i> sp.		lowland	"bark, wood"		1751	B0027741	
moss	Dicranaceae	<i>Oncophorus virens</i>		lowland	"bark, wood"		2256	B0027974	
moss	Dicranaceae	<i>Oncophorus virens</i>		lowland	saxicolous		2343	B0028027	
moss	Orthotrichaceae	<i>Orthotrichum obtusifolium</i>		lowland	"bark, wood"		1865	B0027773	
moss	Meesiaceae	<i>Paludella squarrosa</i>		lowland	terricolous	wet	2310	B0028008	
moss	Bartramiaceae	<i>Philonotis fontana</i> var. <i>pumila</i>		subalpine	terricolous		1556	B0027633	
moss	Bartramiaceae	<i>Philonotis fontana</i>		subalpine	terricolous	wet	1899	B0027788	
moss	Mniaceae	<i>Plagiomnium ellipticum</i>		lowland	terricolous	wet	2316	B0028014	
moss	Mniaceae	<i>Plagiomnium medium</i>		lowland	terricolous	mesic	1841	B0027759	
moss	Mniaceae	<i>Plagiomnium medium</i>		lowland	terricolous	wet	2253	B0027971	
moss	Mniaceae	<i>Plagiomnium medium</i>		lowland	terricolous	mesic	2254	B0027972	
moss	Plagiotheciaceae	<i>Plagiothecium</i> sp.		lowland	"bark, wood"		1757	B0027745	
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	lowland	"log, stump, etc"		1742	B0027734	
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	alpine	saxicolous-terricolous		1652	B0027672	
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	lowland	terricolous	mesic	1713	B0027710	
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	subalpine	terricolous	mesic	1914	B0027792	
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	lowland	terricolous	mesic	2116		
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	lowland	terricolous	wet	2236		
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	lowland	terricolous	mesic	2275	B0027986	
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	lowland	terricolous	mesic	2326		
moss	Hylocomiaceae	<i>Pleurozium schreberi</i>	common	subalpine	terricolous		6177		
moss	Polytrichaceae	<i>Pogonatum dentatum</i>		subalpine	terricolous		1564	B0027640	
moss	Polytrichaceae	<i>Pogonatum dentatum</i>	common	lowland	terricolous	mesic	1730	B0027724	
moss	Polytrichaceae	<i>Pogonatum urnigerum</i>	common	alpine	saxicolous		1606	B0027653	
moss	Polytrichaceae	<i>Pogonatum urnigerum</i>	common	lowland	terricolous	mesic	1712	B0027709	
moss	Polytrichaceae	<i>Pogonatum urnigerum</i>	common	lowland	terricolous	mesic	1722	B0027718	
moss	Polytrichaceae	<i>Pogonatum urnigerum</i>	common	lowland	terricolous	mesic	1723	B0027719	
moss	Polytrichaceae	<i>Pogonatum urnigerum</i>	common	lowland	terricolous	mesic	1850	B0027763	
moss	Polytrichaceae	<i>Pogonatum urnigerum</i>	common	lowland	terricolous	mesic	2094	B0027858	
moss	Polytrichaceae	<i>Pogonatum urnigerum</i>	common	subalpine	terricolous	mesic	2525	B0028142	

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Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.
moss	Bryaceae	<i>Pohlia cruda</i>	common	lowland	terricolous	mesic	1683	B0027702
moss	Bryaceae	<i>Pohlia cruda</i>	common	lowland	terricolous	mesic	1853	B0027766
moss	Bryaceae	<i>Pohlia cruda</i>	common	lowland	terricolous	mesic	1856	B0027769
moss	Bryaceae	<i>Pohlia crudoides</i>		subalpine	saxicolous-terricolous		1999	B0027810
moss	Bryaceae	<i>Pohlia drummondii</i>		alpine	saxicolous		1672	B0027692
moss	Bryaceae	<i>Pohlia drummondii</i>		subalpine	terricolous	wet	1559	B0027635
moss	Bryaceae	<i>Pohlia filum</i>		alpine	terricolous	mesic	2042	B0027831
moss	Bryaceae	<i>Pohlia filum</i>		alpine	terricolous	mesic	2048	B0027837
moss	Bryaceae	<i>Pohlia ludwigii</i>		alpine	terricolous	mesic	2052	B0027841
moss	Bryaceae	<i>Pohlia nutans</i>	common	lowland	"bark, wood"		1758	B0027746
moss	Bryaceae	<i>Pohlia nutans</i>	common	lowland	"log, stump, etc"		1737	B0027729
moss	Bryaceae	<i>Pohlia nutans</i>	common	subalpine	terricolous	mesic	1562	B0027638
moss	Bryaceae	<i>Pohlia nutans</i>	common	lowland	terricolous	mesic	2120	
moss	Bryaceae	<i>Pohlia prolifera</i>	common	subalpine	saxicolous-terricolous		2006	B0027816
moss	Bryaceae	<i>Pohlia prolifera</i>	common	subalpine	saxicolous-terricolous		2007	B0027817
moss	Bryaceae	<i>Pohlia prolifera</i>	common	lowland	terricolous	mesic	1725	B0027721
moss	Bryaceae	<i>Pohlia prolifera</i>	common	lowland	terricolous	mesic	1851	B0027764
moss	Bryaceae	<i>Pohlia prolifera</i>	common	lowland	terricolous	mesic	2303	B0028001
moss	Bryaceae	<i>Pohlia prolifera</i>	common	lowland	terricolous	mesic	2393	B0028066
moss	Bryaceae	<i>Pohlia wahlenbergii</i>		alpine	terricolous		1698	
moss	Polytrichaceae	<i>Polytrichastrum alpinum</i>	common	alpine	saxicolous-terricolous		1654	B0027674
moss	Polytrichaceae	<i>Polytrichastrum alpinum</i>	common	alpine	saxicolous-terricolous		1655	B0027675
moss	Polytrichaceae	<i>Polytrichastrum alpinum</i>	common	subalpine	terricolous	mesic	1998	B0027809
moss	Polytrichaceae	<i>Polytrichastrum sexangulare</i>						
		var. <i>sexangulare</i>		alpine	saxicolous		2411	B0028078
moss	Polytrichaceae	<i>Polytrichastrum sexangulare</i>						
		var. <i>sexangulare</i>		alpine	terricolous	wet	2504	B0028125
moss	Polytrichaceae	<i>Polytrichastrum sexangulare</i>						
		var. <i>sexangulare</i>		alpine	terricolous	wet		
moss	Polytrichaceae	<i>Polytrichum commune</i>	common	lowland	terricolous	mesic	2509	B0028130
moss	Polytrichaceae	<i>Polytrichum commune</i>	common	lowland	terricolous	mesic	2117	
moss	Polytrichaceae	<i>Polytrichum commune</i>	common	lowland	terricolous	mesic	2327	
moss	Polytrichaceae	<i>Polytrichum commune</i>	common	lowland	terricolous	mesic	2331	
moss	Polytrichaceae	<i>Polytrichum commune</i>	common	subalpine	saxicolous-terricolous		1987	B0027801



Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
moss	Polytrichaceae	<i>Polytrichum commune</i>							
		var. <i>commune</i>	common	alpine	terricolous		1697		
moss	Polytrichaceae	<i>Polytrichum commune</i>							
		var. <i>commune</i>	common	lowland	terricolous	mesic	1718	B0027715	
moss	Polytrichaceae	<i>Polytrichum commune</i>							
		var. <i>commune</i>	common	lowland	terricolous	mesic	1735	B0027727	
moss	Polytrichaceae	<i>Polytrichum commune</i>							
		var. <i>commune</i>	common	subalpine	terricolous	mesic	2538	B0028155	
moss	Polytrichaceae	<i>Polytrichum commune</i>							
		var. <i>commune</i>	common	subalpine	terricolous	mesic	2552	B0028166	
moss	Polytrichaceae	<i>Polytrichum hyperboreum</i>	common	alpine	saxicolous		1608	B0027655	
moss	Polytrichaceae	<i>Polytrichum hyperboreum</i>	common	alpine	saxicolous-terricolous		1656	B0027676	
moss	Polytrichaceae	<i>Polytrichum hyperboreum</i>	common	alpine	saxicolous-terricolous		1657	B0027677	
moss	Polytrichaceae	<i>Polytrichum hyperboreum</i>	common	subalpine	saxicolous-terricolous		1992	B0027805	
moss	Polytrichaceae	<i>Polytrichum hyperboreum</i>	common	alpine	terricolous	mesic	1587	B0027645	
moss	Polytrichaceae	<i>Polytrichum hyperboreum</i>	common	alpine	terricolous	mesic	1630	B0027663	
moss	Polytrichaceae	<i>Polytrichum hyperboreum</i>	common	alpine	terricolous	mesic	2502	B0028123	
moss	Polytrichaceae	<i>Polytrichum hyperboreum</i>	common	subalpine	terricolous	mesic	6178		
moss	Polytrichaceae	<i>Polytrichum juniperinum</i>	common	lowland	terricolous	mesic	1707	B0027704	
moss	Polytrichaceae	<i>Polytrichum juniperinum</i>	common	subalpine	terricolous	mesic	6179		
moss	Polytrichaceae	<i>Polytrichum piliferum</i>	common	subalpine	terricolous	mesic	1563	B0027639	
moss	Polytrichaceae	<i>Polytrichum piliferum</i>	common	alpine	terricolous	mesic	1607	B0027654	
moss	Polytrichaceae	<i>Polytrichum piliferum</i>	common	alpine	terricolous	mesic	1631	B0027664	
moss	Polytrichaceae	<i>Polytrichum piliferum</i>	common	lowland	terricolous	mesic	1706	B0027703	
moss	Polytrichaceae	<i>Polytrichum piliferum</i>	common	lowland	terricolous	mesic	1724	B0027720	
moss	Polytrichaceae	<i>Polytrichum piliferum</i>	common	subalpine	terricolous	mesic	6180		
moss	Polytrichaceae	<i>Polytrichum strictum</i>	common	alpine	terricolous	mesic	1682	B0027701	
moss	Polytrichaceae	<i>Polytrichum strictum</i>	common	lowland	terricolous	mesic	1732	B0027726	
moss	Polytrichaceae	<i>Polytrichum strictum</i>	common	lowland	terricolous	wet	2203	B0027943	
moss	Polytrichaceae	<i>Polytrichum strictum</i>	common	lowland	terricolous	wet	2212	B0027952	
moss	Polytrichaceae	<i>Polytrichum strictum</i>	common	alpine	terricolous		2468	B0028105	
moss	Polytrichaceae	<i>Polytrichum strictum</i>	common	alpine	terricolous	wet	2508	B0028129	
moss	Polytrichaceae	<i>Polytrichum strictum</i>	common	subalpine	terricolous	mesic	2555	B0028167	
moss	Polytrichaceae	<i>Polytrichum swartzii</i>		lowland	terricolous	wet	2139	B0027882	

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Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.
moss	Polytrichaceae	<i>Polytrichum swartzii</i>		lowland	terricolous	wet	2140	B0027883
moss	Polytrichaceae	<i>Polytrichum swartzii</i>		lowland	terricolous	wet	2141	B0027884
moss	Mniaceae	<i>Pseudobryum cinctoides</i>		lowland	terricolous	mesic	2209	B0027949
moss		<i>Pseudobryum cinctoides</i>		lowland	terricolous	mesic	2210	B0027950
moss	Leskeaceae	<i>Pseudoleskeella</i> sp.		lowland	saxicolous		2357	B0028041
moss	Hypnaceae	<i>Ptilium crista-castrensis</i>	common	lowland	"log, stump, etc"		1743	B0027735
moss	Hypnaceae	<i>Ptilium crista-castrensis</i>	common	lowland	terricolous	mesic	1842	B0027760
moss	Hypnaceae	<i>Ptilium crista-castrensis</i>	common	lowland	terricolous	mesic	2118	
moss	Hypnaceae	<i>Ptilium crista-castrensis</i>	common	lowland	terricolous	mesic	2224	B0027956
moss	Hypnaceae	<i>Ptilium crista-castrensis</i>	common	lowland	terricolous	mesic	2269	B0027984
moss	Hypnaceae	<i>Ptilium crista-castrensis</i>	common	lowland	terricolous	mesic	2328	
moss	Hypnaceae	<i>Ptilium crista-castrensis</i>	common	lowland	terricolous	mesic	2332	
moss	Hypnaceae	<i>Pylaisiella polyantha</i>		lowland	"bark, wood"		1753	B0027743
moss	Hypnaceae	<i>Pylaisiella polyantha</i>		lowland	"bark, wood"		1761	B0027749
moss	Hypnaceae	<i>Pylaisiella polyantha</i>		lowland	"bark, wood"		1838	B0027756
moss	Hypnaceae	<i>Pylaisiella polyantha</i>		lowland	"bark, wood"		2092	B0027856
moss	Hypnaceae	<i>Pylaisiella polyantha</i>		lowland	"log, stump, etc"		1863	B0027771
moss	Grimmiaceae	<i>Racomitrium affine</i>		alpine	terricolous	mesic	2410	B0028077
moss	Grimmiaceae	<i>Racomitrium affine</i>		alpine	terricolous	mesic	2415	B0028081
moss	Grimmiaceae	<i>Racomitrium affine</i>		alpine	terricolous	mesic	2419	B0028085
moss	Grimmiaceae	<i>Racomitrium canescens</i>	common	alpine	terricolous	mesic	1646	B0027666
moss	Grimmiaceae	<i>Racomitrium ericoides</i>	common	subalpine	terricolous	mesic	1552	B0027629
moss	Grimmiaceae	<i>Racomitrium ericoides</i>	common	subalpine	terricolous	mesic	1553	B0027630
moss	Grimmiaceae	<i>Racomitrium ericoides</i>	common	lowland	terricolous	mesic	1708	B0027705
moss	Grimmiaceae	<i>Racomitrium ericoides</i>	common	lowland	terricolous	mesic	1711	B0027708
moss	Grimmiaceae	<i>Racomitrium ericoides</i>	common	alpine	terricolous	mesic	2476	B0028113
moss	Grimmiaceae	<i>Racomitrium fasciculare</i>		alpine	saxicolous		1626	B0027659
moss	Grimmiaceae	<i>Racomitrium lanuginosum</i>	common	subalpine	saxicolous		1982	B0027798
moss	Grimmiaceae	<i>Racomitrium lanuginosum</i>	common	alpine	terricolous	mesic	1589	B0027647
moss	Mniaceae	<i>Rhizomnium andrewsianum</i>		alpine	terricolous	wet	2501	B0028122
moss	Mniaceae	<i>Rhizomnium gracile</i>		lowland	terricolous	wet	2314	B0028012
moss	Mniaceae	<i>Rhizomnium magnifolium</i>		lowland	terricolous	mesic	2252	B0027970
moss	Mniaceae	<i>Rhizomnium magnifolium</i>		lowland	terricolous	wet	2312	B0028010
moss		<i>Rhizomnium nudum</i>		lowland	terricolous	mesic	2211	B0027951

Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
moss		<i>Rhizomnium pseudopunctatum</i>		lowland	terricolous	mesic	2223	B0027955	
moss	Mniaceae	<i>Rhizomnium pseudopunctatum</i>		lowland	terricolous	wet	2315	B0028013	
moss	Hylacomiaceae	<i>Rhytidiadelphus triquetrus</i>	common	lowland	terricolous	mesic	2096	B0027860	
moss	Hylacomiaceae	<i>Rhytidiadelphus triquetrus</i>	common	lowland	terricolous	mesic	2277	B0027988	
moss	Rhytidiaceae	<i>Rhytidium rugosum</i>		alpine	saxicolous		1627	B0027660	
moss	Rhytidiaceae	<i>Rhytidium rugosum</i>		lowland	terricolous	mesic	2394	B0028067	
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	lowland	"bark, wood"		1760	B0027748	
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	lowland	"bark, wood"		2078	B0027852	
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	alpine	saxicolous-terricolous		1648	B0027668	
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	lowland	terricolous	mesic	1715	B0027712	
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	lowland	terricolous	mesic	2106		
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	subalpine	terricolous	mesic	2108		
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	lowland	terricolous	mesic	2119		
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	lowland	terricolous	wet	2138	B0027881	
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	lowland	terricolous	mesic	2238		
moss	Amblystegiaceae	<i>Sanionia uncinata</i>	common	lowland	terricolous	mesic	2329		
moss	Grimmiaceae	<i>Schistidium</i> sp.		alpine	saxicolous		1604	B0027651	
moss	Schistostegaceae	<i>Schistostega pennata</i>		lowland	terricolous	mesic	2302	B0028000	
moss	Scouleriaceae	<i>Scouleria</i> sp.		lowland	saxicolous		2336	B0028020	
moss	Sphagnaceae	<i>Sphagnum aongstroemii</i>		lowland	terricolous	wet	2155	B0027898	
moss	Sphagnaceae	<i>Sphagnum capillifolium</i>		lowland	terricolous	wet	2169	B0027910	
moss	Sphagnaceae	<i>Sphagnum centrale</i>	common	lowland	terricolous	wet	2142	B0027885	
moss	Sphagnaceae	<i>Sphagnum centrale</i>	common	lowland	terricolous	wet	2145	B0027888	
moss	Sphagnaceae	<i>Sphagnum centrale</i>	common	lowland	terricolous	wet	2149	B0027892	
moss	Sphagnaceae	<i>Sphagnum centrale</i>	common	lowland	terricolous	wet	2150	B0027893	
moss	Sphagnaceae	<i>Sphagnum centrale</i>	common	lowland	terricolous	wet	2175	B0027915	
moss	Sphagnaceae	<i>Sphagnum centrale</i>	common	lowland	terricolous	wet	2176	B0027916	
moss	Sphagnaceae	<i>Sphagnum fuscum</i>	common	lowland	terricolous	wet	2151	B0027894	
moss	Sphagnaceae	<i>Sphagnum fuscum</i>	common	lowland	terricolous	wet	2168	B0027909	
moss	Sphagnaceae	<i>Sphagnum girgensohnii</i>	common	alpine	saxicolous-terricolous		1647	B0027667	
moss	Sphagnaceae	<i>Sphagnum girgensohnii</i>	common	alpine	saxicolous-terricolous		1659	B0027679	
moss	Sphagnaceae	<i>Sphagnum girgensohnii</i>	common	lowland	terricolous	wet	2173	B0027914	
moss	Sphagnaceae	<i>Sphagnum girgensohnii</i>		lowland	terricolous	wet	2192	B0027932	
moss	Sphagnaceae	<i>Sphagnum girgensohnii</i>	common	lowland	terricolous	wet	2240	B0027958	

## Synopsis of Cryptogam Collections for Fort Richardson, AK

Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.
moss	Sphagnaceae	<i>Sphagnum girgensohnii</i>		alpine	terricolous	wet	2493	B0028121
moss	Sphagnaceae	<i>Sphagnum lenense</i>	common	lowland	terricolous	wet	2186	B0027926
moss	Sphagnaceae	<i>Sphagnum lenense</i>	common	lowland	terricolous	wet	2188	B0027928
moss	Sphagnaceae	<i>Sphagnum lenense</i>	common	lowland	terricolous	wet	2189	B0027929
moss	Sphagnaceae	<i>Sphagnum lenense</i>	common	lowland	terricolous	wet	2190	B0027930
moss	Sphagnaceae	<i>Sphagnum lenense</i>	common	lowland	terricolous	wet	2191	B0027931
moss	Sphagnaceae	<i>Sphagnum lenense</i>	common	lowland	terricolous	wet	2196	B0027936
moss	Sphagnaceae	<i>Sphagnum magellanicum</i>	common	lowland	terricolous	wet	2144	B0027887
moss	Sphagnaceae	<i>Sphagnum magellanicum</i>	common	lowland	terricolous	wet	2146	B0027889
moss	Sphagnaceae	<i>Sphagnum magellanicum</i>	common	lowland	terricolous	wet	2147	B0027890
moss	Sphagnaceae	<i>Sphagnum magellanicum</i>	common	lowland	terricolous	wet	2148	B0027891
moss	Sphagnaceae	<i>Sphagnum magellanicum</i>	common	lowland	terricolous	wet	2177	B0027917
moss	Sphagnaceae	<i>Sphagnum magellanicum</i>	common	lowland	terricolous	wet	2178	B0027918
moss	Sphagnaceae	<i>Sphagnum magellanicum</i>	common	lowland	terricolous	wet	2179	B0027919
moss	Sphagnaceae	<i>Sphagnum papillosum</i>	common	lowland	terricolous	wet	2143	B0027886
moss	Sphagnaceae	<i>Sphagnum recurvum</i>	common	lowland	terricolous	wet	2164	B0027907
moss	Sphagnaceae	<i>Sphagnum recurvum</i>	common	lowland	terricolous	wet	2194	B0027934
moss	Sphagnaceae	<i>Sphagnum recurvum</i> var. <i>tenue</i>	common	lowland	terricolous	wet	2171	B0027912
moss	Sphagnaceae	<i>Sphagnum riparium</i>	common	lowland	terricolous	wet	2204	B0027944
moss	Sphagnaceae	<i>Sphagnum russowii</i>	common	lowland	terricolous	wet	2163	B0027906
moss	Sphagnaceae	<i>Sphagnum russowii</i>	common	lowland	terricolous	wet	2318	B0028016
moss	Sphagnaceae	<i>Sphagnum squarrosum</i>	common	lowland	terricolous	wet	2154	B0027897
moss	Sphagnaceae	<i>Sphagnum squarrosum</i>	common	lowland	terricolous	wet	2206	B0027946
moss	Sphagnaceae	<i>Sphagnum subsecundum</i>						
		var. <i>subsecundum</i>	common	lowland	terricolous	wet	2153	B0027896
moss	Sphagnaceae	<i>Sphagnum subsecundum</i>						
		var. <i>subsecundum</i>	common	lowland	terricolous	wet	2156	B0027899
moss	Sphagnaceae	<i>Sphagnum teres</i>	common	lowland	terricolous	wet	2241	B0027959
moss	Tetraphidaceae	<i>Tetraphis pellucida</i>		lowland	"log, stump, etc"		1747	B0027737
moss	Tetraphidaceae	<i>Tetraphis pellucida</i>		lowland	"log, stump, etc"		2262	B0027979
moss	Tetraphidaceae	<i>Tetraphis pellucida</i>		lowland	terricolous	mesic	2225	B0027957
moss	Slachnaceae	<i>Tetraplodon</i> sp.		lowland	terricolous	wet	2311	B0028009
moss	Timmiaceae	<i>Timmia austriaca</i>		alpine	saxicolous		1673	B0027693
moss	Timmiaceae	<i>Timmia austriaca</i>		subalpine	saxicolous-terricolous		2009	B0027819

Synopsis of Cryptogam Collections for Fort Richardson, AK									
Group	Family	Taxon	Occurrence	Zone	Substrate	Moisture	DB No.	ALA No.	
moss	Brachytheciaceae	<i>Tomentypnum nitens</i>		lowland	terricolous	wet	2317	B0028015	
moss	Pottiaceae	<i>Tortella fragilis</i>		alpine	terricolous		1590	B0027648	
moss	Pottiaceae	<i>Tortula ruralis</i>		lowland	saxicolous		2360	B0028044	
moss	Pottiaceae	<i>Tortula ruralis</i>		alpine	terricolous		1629	B0027662	
moss	Pottiaceae	<i>Tortula ruralis</i>		lowland	terricolous	mesic	1882	B0027785	

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